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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK. VOLUME 95. AV-8A AIR--ETC(U)  
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USAF BIOENVIRONMENTAL NOISE DATA HANDBOOK

Volume 95.

AV-8A Aircraft, Far-Field Noise.

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Robert G. / Powell

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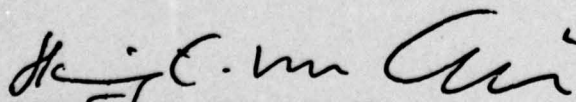
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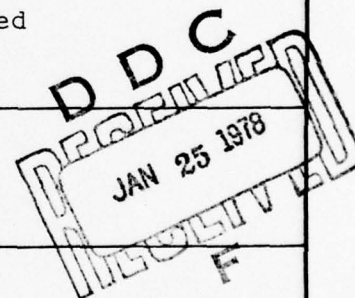
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Aerospace Medical Research Laboratory



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The USMC AV-8A is a V/STOL light-attack aircraft powered by one F402-RR-401 turbojet engine. This report provides far-field measured and extrapolated data defining both physical and psychoacoustic measures of the bioacoustic environments produced by this aircraft operating on a ground runup pad for two power conditions and in two hover modes (50 and 100 feet above ground level). Far-field data measured at 17 locations are normalized to standard		





→ meteorological conditions and extrapolated from 75-8000 meters to derive sets of equal-value contours as a function of angle and distance from the source. These contours are measures of: overall and band sound pressure levels, C-weighted and A-weighted sound levels, preferred speech interference level, perceived noise level, and limiting times for total daily exposure of personnel with and without standard Air Force ear protectors. Refer to Volume 1 of this handbook, "USAF Bioenvironmental Noise Data Handbook, Vol 1: Organization, Content and Application", AMRL-TR-75-50(1) 1975, for discussion of the objective and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. ↑

## PREFACE

This report was prepared by the Biodynamic Environment Branch, Aerospace Medical Research Laboratory, under Project/Task 72S104, Measurement and Prediction of Noise Environments of Air Force Operations.

The author gratefully acknowledges Mr. John Cole for his assistance in preparing this report, Capt Nick Farinacci, Mr. Harald Hille, and Mr. Jerry Speakman for their assistance in acquiring the raw data, Mr. Keith Kettler, Mr. Henry Mohlman and Mr. David Eilerman of the University of Dayton for assistance in the mechanics of data processing, and Mrs. Peggy Massie and Mr. Mike Patterson for assistance in typing and preparation of the graphics.

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## INTRODUCTION

The USMC AV-8A is a V/STOL light-attack aircraft powered by one F402-RR-401 turbojet engine. The aircraft was manufactured by Hawker Siddeley and the engine by Rolls-Royce both of which are from the United Kingdom.

This volume provides measured and extrapolated data defining bioacoustic environments produced by this aircraft during ground runup operations. Such data are essential to evaluate ear protection requirements, limiting personnel exposure times, voice communication capabilities, and annoyance problems associated with ground runups of the AV-8A aircraft.

This volume is one of a series published by the Aerospace Medical Research Laboratory (AMRL) under the same report number (AMRL-TR-75-50) as a multi-volume handbook that quantifies the noise environments produced at flight/ground crew locations and in surrounding communities by operations of Air Force aircraft and ground support equipment. The far-field, community-type noise data in the handbook describe the noise produced during *ground operations* of aircraft, ground support equipment, and other ground-based equipment or facilities.

Volume 1 of this handbook discusses the objectives and design of the handbook, the types of data presented, measurement procedures, instrumentation, data processing, definitions of quantities, symbols, equations, applications, limitations, etc. Volume 2 provides a method and data for adjusting the handbook's far-field noise data, which are for standard meteorological conditions (15°C temperature, 70% rel humidity, 0.760 meters Hg barometric pressure), to derive comparable data for other meteorological conditions. *Refer to Volumes 1 and 2* (references 1 and 2) for such information because it is not repeated in other handbook volumes.

A cumulative index lists those aerospace systems contained in the handbook, and identifies the specific volumes containing each type of environmental noise data available (i.e., inflight/flight crew and passenger noise, near-field/ground crew noise, far-field/community noise). Volume numbers are assigned sequentially as individual volumes are published. This index is periodically updated as individual volumes are published and is available upon request from AMRL/BBE, Wright-Patterson AFB, OH 45433. Organizations on the distribution list for the handbook will automatically receive a copy of each updated index.

Direct any questions concerning the technical data in this report and other handbook volumes to: AMRL/BBE, Wright-Patterson AFB, OH 45433; AUTOVON 78-53675 or 78-53664; Commercial (513) 255-3675 or (513) 255-3664.

1. Cole, John N., *USAF Bioenvironmental Noise Data Handbook Volume 1: Organization, Content and Application*, AMRL-TR-75-50 (1), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.
2. Cole, John N., *USAF Bioenvironmental Noise Data Handbook, Volume 2: Procedure to Evaluate Effects of Non-standard Meteorological Conditions on Far-Field Noise*, AMRL-TR-75-50 (2), Aerospace Medical Research Laboratory, Wright-Patterson Air Force Base, Ohio, 1975.

## FAR-FIELD NOISE

### MEASUREMENTS

AMRL acquired the far-field data during a 1-hour test periods thus keeping similar meteorological conditions throughout the test. Figure 1 shows the ground runup area (taxiway), ground cover, aircraft orientation and microphone measurement sites on each semicircle. The center of the 75 meter radius semicircles used in surveying the F402-RR-401 engine was on the ground directly below the intersection of the aircraft's centerline and the plane passing through both engines' exhaust-nozzle exit. The runup tests (idle and 55% RPM) were with the aircraft on the ground whereas for the hover tests the aircraft was vertically positioned (50/100 feet) over the same position (Figure 1). The ground runup area did not have a blast deflector; therefore, the engine's exhaust was in a "free-flow" condition.

Table 1 provides cockpit readouts of engine characteristics (RPM, fuel flow, etc.) for each power setting used in the far-field tests. Also listed in this table are the surface meteorological conditions during data acquisition.

All microphone measurement sites are in the acoustic far-field of the source where the sound wave-fronts spherically diverge and the noise source may be regarded as a point source.

A portable microphone/tape-recorder sytem was used to sequentially record the noise at each far-field location. The microphone was attached to a hand-held pole, pointed at the source (0° angle of incidence) and vertically scanned from 0.5 to 3 meters for a period of 5-10 seconds during data acquisition at each microphone location. These samples were then time-integrated to derive a root-mean-square sound pressure level. Vertical scanning and time-integrating together reduce anomalies frequently present in data acquired by a fixed height microphone.

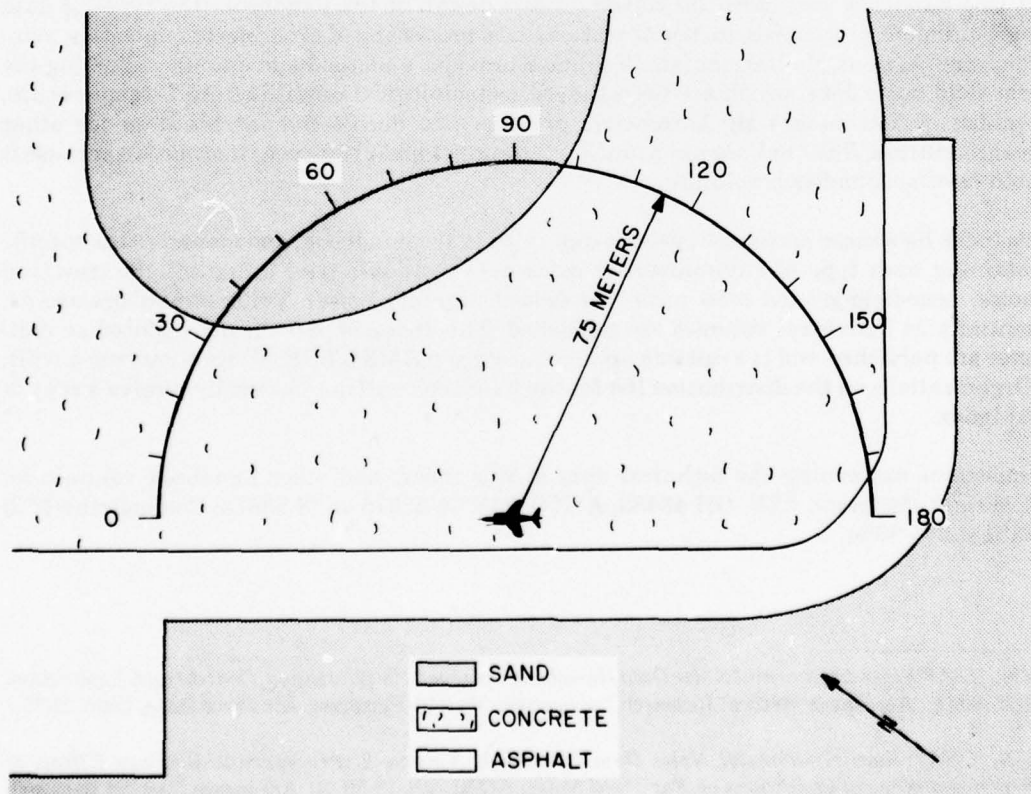


Figure 1. Far-Field Measurement Locations on the Taxiway at ALF, San Clemente Island

TABLE 1  
TEST CONDITIONS  
FOR FAR-FIELD NOISE MEASUREMENTS

AV-8A Aircraft, Ground Runups, ALF, San Clemente Island  
Tail #158706, 15 May 1977

*Aircraft Engine Operation*

Idle Power	27 % RPM 325 C, Exhaust Gas Temp 1200 LBS/HR, Fuel Flow
55% RPM Runup	55 % RPM 350 C, EGT 2820 LBS/HR, Fuel Flow
50 Foot Hover	98 % RPM 680 C, EGT 12,360 LBS/HR, FF
100 Foot Hover	95 % RPM 650 C, EGT 11,760 LBS/HR, FF

*Meteorology*

Temperature	18.3 C
Bar Pressure	0.766 M Hg
Rel Humidity	58 %
Wind — Speed	3.6 M/Sec (7 KTS)
— Direction	300 Deg

**RESULTS**

Table 2 lists the overall and 1/3 octave band SPL measured at the far-field locations under meteorological conditions at the time of the test. Data in all other figures and tables are based on these levels. These data were normalized to 100 meters distance and standard meteorological conditions (15 C temperature, 70% relative humidity, 0.760 meter Hg barometric pressure) and used to derive the graphic data in Figure 2 which provides a compact summary of the far-field noise characteristics of the AV-8A aircraft in a standard format.

Figure 3 and Table 3 present two basic acoustic measures, the acoustic power levels and the directivity index, respectively. The acoustic power level describes the power radiated by the source as a function of the frequency. The directivity index is a standard acoustical engineering measure that describes the geometric way in which the source radiates this power as a function of both frequency and angle from source. These basic source measures are primarily of interest for acoustical engineers and noise generation/control specialists. No such data are presented for the VTOL maneuvers (50- and 100-foot hover operations) since the noise source is no longer rotationally symmetric about the engine's centerline (see Volume 1, pages 30 and 31). Hovering is achieved through thrust vectoring (the exhaust flow is directed downward), which makes the noise source almost radially symmetric in the ground plane. This symmetry is seen in table 2 and figure 2 for the hover data.

Estimates of ground runup noise levels for intermediate power settings (e.g., 50% RPM) can be determined as explained in Volume 1 of this handbook.



Figures 4 through 10 are sets of equal noise contours describing seven different measures of noise as a function of angle and distance from the source for standard day meteorology. They are respectively, overall sound pressure level, C-weighted sound level, A-weighted sound level, perceived noise level, speech interference level, permissible exposure times for personnel and octave band sound pressure levels. No contours are presented for the hover data. When hovering the noise source is above the ground plane; therefore, the angle between the source and the receiver changes more than 20 degrees as one views it from 75 meters out to 8000 meters for the 100 foot hover operation. Since the noise source is not symmetrical in this vertical plane the extrapolated noise contours are omitted.

Test personnel performed noise surveys during quiet periods when the background noise was minimal, e.g., early in the morning when no other aircraft or engine test stands were operating. No data are presented at the 170/180 degree locations for the idle, 55% RPM and 50 foot hovers, nor at the 150/160/170/180 locations for the 100 foot hover power settings because of turbulent air flow behind the aircraft. Typically, the A-weighted levels for these angles are 5 to 20 DBA below the level measured at the preceding microphone location.

Volume 2 of the handbook describes the influence of meteorology on far-field noise environments, and provides, if required, the factors necessary to adjust the handbook's standard meteorological day data.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																
1/3 OCTAVE BAND																
DISTANCE = 75 METERS																
NOISE SOURCE/SUBJECT:																
OPERATION:																
METEOROLOGY:																
TEMP = 18 C																
BAR PRESS = .766 M HG																
REL HUMID = 58 %																
PAGE 2																
IDENTIFICATION:																
OMEGA 1.4																
TEST 75-002-006																
RUN 01																
06 MAY 75																
FREQ (HZ)																
ANGLE (DEGREES)																
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180																
25	66<	61<	64<	60<	67<	66<	63<	64<	70<	62<	63<	64<	64<	64<	63<	64<
31.5	66<	65<	66<	66<	66<	66<	67<	68<	70<	65<	66<	67<	68<	68<	68<	67<
40	70<	71<	71<	69<	72<	72<	72<	73<	73<	70<	72<	74<	74<	75<	75<	73<
50	74<	74<	74<	73<	72<	74<	74<	74<	74<	73<	74<	74<	76<	78<	77<	75<
63	77<	77<	77<	77<	77<	76<	76<	75<	71<	71<	74<	76<	77<	81<	80<	77<
80	73<	74<	74<	75<	73<	71<	69<	66<	67<	69<	70<	73<	75<	77<	77<	71<
100	72<	73<	73<	72<	70<	70<	73<	73<	74<	74<	72<	70<	69<	71<	73<	74<
125	70<	70<	70<	71<	70<	70<	72<	71<	70<	69<	71<	73<	72<	72<	71<	72<
160	70<	71<	71<	72<	71<	69<	69<	67<	67<	66<	68<	71<	72<	73<	71<	70<
200	70<	70<	71<	72<	71<	67<	66<	69<	69<	68<	70<	72<	73<	76<	73<	70<
250	71<	72<	72<	74<	70<	67<	66<	66<	66<	68<	71<	73<	74<	76<	73<	70<
315	72<	74<	74<	75<	72<	71<	72<	72<	68<	68<	71<	73<	74<	76<	75<	56<
400	72<	74<	74<	73<	70<	70<	71<	72<	68<	69<	72<	72<	74<	75<	65<	58<
500	72<	75<	74<	72<	72<	71<	71<	70<	68<	69<	73<	72<	71<	70<	72<	66<
630	73<	75<	74<	74<	72<	71<	71<	69<	67<	69<	72<	73<	72<	70<	69<	65<
800	74<	81<	79<	78<	75<	75<	74<	70<	68<	68<	70<	71<	70<	67<	68<	58<
1000	78<	77<	77<	76<	74<	71<	71<	70<	68<	68<	70<	71<	70<	67<	65<	59<
1250	94<	93<	93<	94<	91<	82<	77<	83<	72<	77<	77<	75<	82<	77<	71<	66<
1600	85<	82<	82<	82<	80<	76<	79<	73<	73<	73<	72<	71<	70<	68<	62<	55<
2000	81<	80<	80<	80<	78<	77<	75<	73<	72<	71<	72<	72<	73<	71<	65<	54<
2500	83<	85<	84<	83<	81<	82<	81<	79<	78<	74<	74<	73<	73<	70<	65<	56<
3150	85<	84<	84<	83<	81<	82<	81<	78<	75<	76<	76<	74<	72<	70<	65<	56<
4000	99<	97<	93<	92<	88<	90<	94<	91<	91<	84<	84<	82<	81<	78<	77<	73<
5000	92<	90<	89<	92<	88<	89<	90<	85<	84<	83<	81<	79<	76<	76<	71<	62<
6300	86<	84<	85<	83<	83<	81<	79<	78<	77<	78<	78<	78<	77<	74<	73<	68<
8000	84<	83<	83<	81<	81<	79<	77<	76<	75<	75<	76<	75<	74<	70<	65<	55<
10000	80<	79<	78<	78<	77<	75<	74<	72<	72<	70<	72<	71<	67<	66<	61<	51<
OVERALL	101	100	98	98	96	94	96	93	93	89	90	89	88	88	86	81

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																
1/3 OCTAVE BAND																
DISTANCE = 75 METERS																
NOISE SOURCE/SUBJECT: ( OPERATION: ) METEOROLOGY: ) IDENTIFICATION:																
AV-8A AIRCRAFT ( 55% RPM ) TEMP = 18 C ) OMEGA 1.4																
F402-RR-401 ENGINE ( FREE FLOW ) BAR PRESS = .766 M HG ) TEST 75-002-006																
FAR FIELD NOISE ( ) REL HUMID = 58 % ) RUN 02																
FREQ ( HZ ) ANGLE ( DEGREES )																
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
25	72	71	73	67<	74	76	77	76	76	75	77	76	76	78	78	80
31.5	73	73	75	70<	77	78	79	80	79	78	80	79	81	81	81	83
40	77	77	77	73	79	80	82	82	82	81	82	82	82	84	85	86
50	78	79	79	75	80	80	82	82	81	81	82	83	85	85	87	86
63	81	81	81	77	82	82	82	83	83	82	84	85	86	87	88	86
80	82	82	82	77	83	83	82	81	81	82	83	84	85	87	87	87
100	83	83	83	79	83	84	86	87	87	87	87	88	89	90	90	88
125	86	86	86	81	86	86	85	83	83	84	88	89	90	90	90	86
160	86	87	87	83	88	87	85	84	83	83	85	88	89	89	88	84
200	87	86	87	82	86	85	84	83	83	84	86	87	89	89	87	82
250	87	87	87	84	85	83	83	82	84	84	88	88	90	89	84	81
315	86	85	86	82	85	84	84	85	83	84	88	88	90	91	84	80
400	87	87	88	82	85	85	86	85	85	86	89	89	88	89	86	82
500	86	89	88	82	86	85	85	84	85	87	88	88	88	89	87	82
630	87	89	87	82	87	86	85	83	84	85	88	88	88	86	87	82
800	88	89	87	84	86	86	86	85	85	87	89	88	86	86	85	81
1000	89	88	87	82	87	86	86	85	85	87	89	86	83	82	81	81
1250	91	89	87	81	89	86	86	86	86	88	87	82	81	81	80	59
1600	99	96	92	86	101	91	95	89	93	90	88	89	85	81	84	82
2000	92	91	89	83	90	88	87	86	85	86	85	82	79	78	77	58
2500	98	100	95	91	96	93	94	91	89	91	89	88	85	82	81	81
3150	97	97	95	90	92	91	91	90	90	90	89	86	86	84	82	80
4000	96	95	95	91	94	94	93	93	88	91	89	88	85	82	81	77
5000	94	95	93	89	93	93	92	92	90	92	91	89	87	84	82	78
6300	91	92	92	85	90	90	91	89	87	89	89	87	85	83	81	77
8000	89	90	89	83	88	88	87	88	85	87	86	84	81	79	77	73
10000	85	86	85	79	84	84	83	83	81	83	83	80	78	75	74	69
OVERALL	106	105	103	99	105	102	102	101	100	101	101	101	101	100	100	97
																89

< LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.



TABLE: MEASURED SOUND PRESSURE LEVEL (DB)		IDENTIFICATION:																		
2	1/3 OCTAVE BAND	OMEGA 1.4																		
	DISTANCE = 75 METERS	TEST 75-002-006																		
NOISE SOURCE/SUBJECT:		RUN 03																		
AV-8A AIRCRAFT		METEOROLOGY:																		
F402-RR-401 ENGINE		TEMP = 18 C																		
FAR FIELD NOISE		BAR PRESS = .766 M HG																		
		REL HUMID = 58 %																		
		06 MAY 75																		
		PAGE 2																		
FREQ (HZ)		ANGLE (DEGREES)																		
		0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
25	83	83	83	83	91	83	83	82	80	80	83	81	82	82	81	82	81	85		
31.5	87	87	87	93	87	85	83	84	84	83	86	82	82	84	85	85	84	84		
40	90	91	90	94	90	89	83	83	89	89	89	88	87	88	87	88	89	89		
50	92	92	91	94	91	91	91	90	91	90	89	89	88	89	89	90	90	89		
63	95	96	95	95	95	94	94	91	93	93	93	91	91	92	92	93	91	92		
80	95	98	97	97	96	97	93	93	95	94	95	95	94	94	95	96	95	95		
100	98	101	100	101	100	101	97	100	100	100	98	99	98	98	98	99	98	98		
125	99	103	102	103	103	103	99	102	102	101	102	102	100	100	100	102	100	100		
160	103	105	105	105	106	106	102	102	102	103	104	104	101	103	101	102	101	101		
200	103	105	106	105	107	108	102	106	106	106	104	106	103	105	102	104	104	102		
250	105	107	108	108	108	108	104	104	107	106	102	108	104	107	105	105	105	103		
315	104	107	109	108	107	107	105	105	108	105	103	108	105	107	106	104	106	104		
400	103	105	109	108	107	106	105	105	108	105	103	109	107	107	107	106	107	104		
500	102	104	109	108	106	106	104	104	108	103	104	108	107	105	107	107	107	104		
630	102	105	108	110	106	107	105	105	108	103	106	108	106	106	108	108	106	104		
800	103	105	109	110	107	108	105	109	105	109	105	107	107	106	104	107	105	103		
1000	103	106	109	109	107	109	104	104	109	105	106	108	105	104	106	108	104	103		
1250	103	106	109	108	107	109	103	109	103	109	105	106	108	105	104	107	107	103		
1600	104	107	109	109	107	109	102	110	106	106	106	107	104	104	107	106	103	103		
2000	103	106	109	107	106	108	101	108	101	108	105	107	104	104	107	106	103	103		
2500	103	106	109	107	105	107	101	107	104	105	105	103	103	103	105	104	103	101		
3150	101	104	106	105	103	105	99	105	103	103	103	103	102	102	104	103	102	101		
4000	102	105	107	106	105	106	100	105	104	103	104	103	104	103	105	104	103	102		
5000	103	105	108	106	104	106	100	105	103	102	102	103	102	102	103	103	102	101		
6300	99	102	105	103	101	103	98	103	100	100	100	100	99	100	100	100	99	98		
8000	98	100	102	101	100	101	96	101	96	101	99	97	98	96	98	98	97	95		
10000	95	97	99	98	97	98	93	98	95	95	94	94	92	94	94	94	93	91		
OVERALL	115	118	120	120	119	120	115	120	117	117	117	119	117	117	118	118	117	115		
LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																				

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.

TABLE: MEASURED SOUND PRESSURE LEVEL (DB)																			IDENTIFICATION:	
1/3 OCTAVE BAND																				
DISTANCE = 75 METERS																			OMEGA 1.4	
																			TEST 75-002-006	
NOISE SOURCE/SUBJECT:																			RUN 04	
( OPERATION:																				
( ( 100 FOOT HOVER																			TEMP = 18 C	
( ( 95% RPM																			BAR PRESS = .766 M HG	
( (																			REL HUMID = 58 %	
( (																			PAGE 2	
METEOROLOGY:																				
TEMP																				
AV-8A AIRCRAFT																				
F402-RR-401 ENGINE																				
FAR FIELD NOISE																				
ANGLE (DEGREES)																				
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	
25	83	84	82	84	82	82	83	83	83	83	81	82	82	81	81					
31.5	88	87	87	87	86	84	85	86	85	85	85	83	84	85	84					
40	92	89	91	89	89	90	90	89	89	89	90	88	90	89	89					
50	91	91	92	91	92	90	91	91	90	91	90	89	90	90	90					
63	96	94	94	94	94	95	94	94	94	94	93	92	93	92	92					
80	94	94	95	95	95	95	94	95	95	94	94	95	96	94	95					
100	98	98	97	99	98	99	99	97	97	98	95	97	98	96	97					
125	97	99	100	101	97	102	99	100	99	99	95	98	98	97	99					
160	99	99	101	102	101	105	102	99	99	100	98	99	98	96	98					
200	99	99	102	102	101	105	103	97	97	101	103	99	103	101	100					
250	101	101	105	104	103	104	105	100	98	100	107	103	107	104	102					
315	101	103	107	106	106	106	106	103	105	102	109	107	107	109	105					
400	101	103	107	106	108	108	106	105	107	105	107	107	107	109	105					
500	101	102	108	106	107	108	106	106	108	106	109	107	110	107	106					
630	102	102	109	107	107	106	105	106	107	103	108	108	110	107	108					
800	102	104	109	107	108	106	106	106	106	103	107	107	110	107	107					
1000	102	104	108	107	107	106	106	107	106	102	108	107	109	106	106					
1250	102	103	109	107	106	106	105	105	105	103	107	107	109	106	105					
1600	103	104	109	107	106	107	106	106	105	103	107	106	108	105	104					
2000	103	104	109	106	105	106	105	104	104	103	106	106	108	105	104					
2500	103	104	108	106	105	106	105	103	103	102	105	105	106	104	103					
3150	100	103	106	104	102	104	102	101	101	100	104	104	106	103	102					
4000	103	104	107	105	103	105	103	101	101	100	104	104	105	106	103					
5000	103	104	107	105	103	104	103	101	101	101	104	104	105	102	102					
6300	100	101	104	102	100	102	100	98	99	97	101	101	102	99	99					
8000	98	99	102	99	98	100	98	97	96	96	99	99	100	97	97					
10000	95	96	98	97	95	97	95	93	93	93	95	95	96	93	93					
OVERALL	114	115	120	118	118	118	117	116	117	115	119	118	120	117	117					
LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.																				

LEVEL CORRECTED TO REMOVE BACKGROUND/ELECTRONIC NOISE.





FIGURE: NORMALIZED FARFIELD NOISE LEVELS

2 DISTANCE = 100 METERS

NOISE SOURCE/SUBJECT:

AV-8A AIRCRAFT

F402-RR-401 ENGINE

FAR FIELD NOISE

OPERATION:

55% RPM

FREE FLOW

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

IDENTIFICATION:

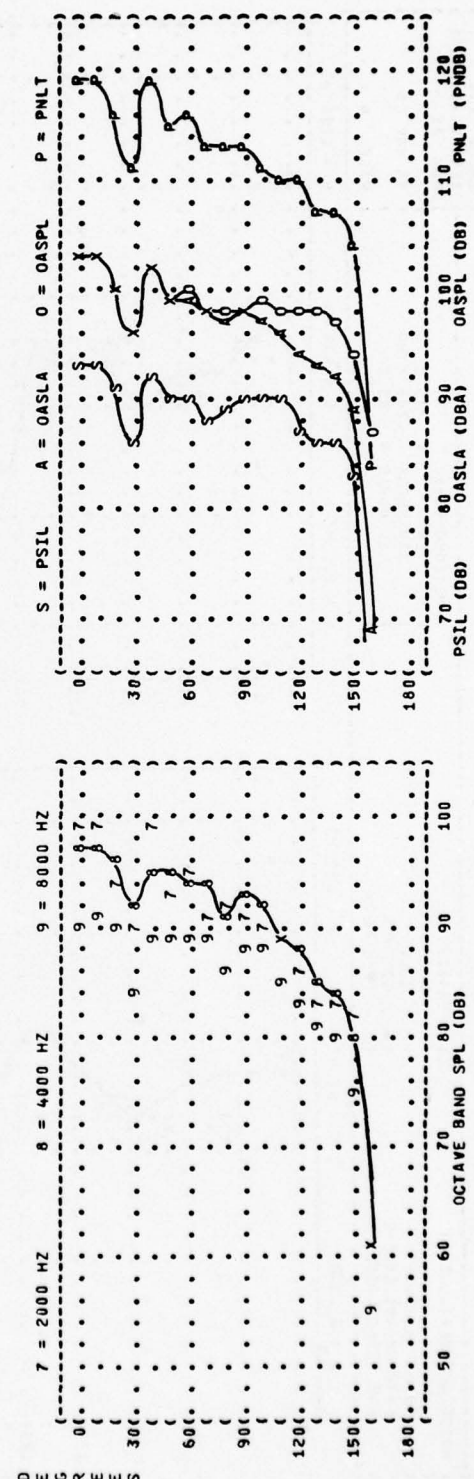
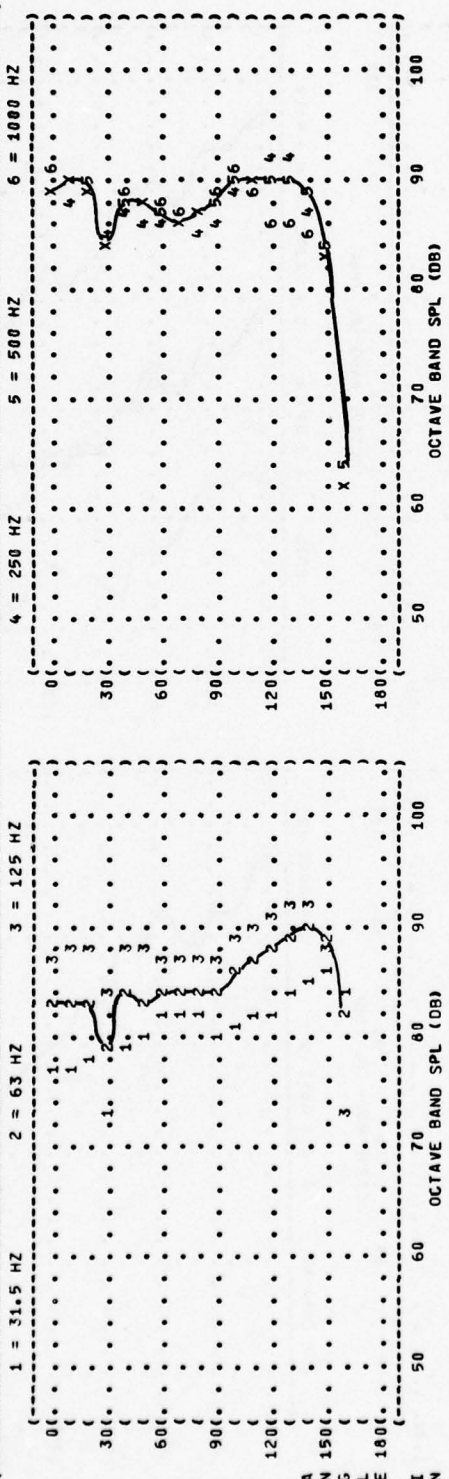
OMEGA 1.4

TEST 75-002-006

RUN 02

06 MAY 75

PAGE 6









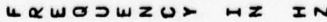


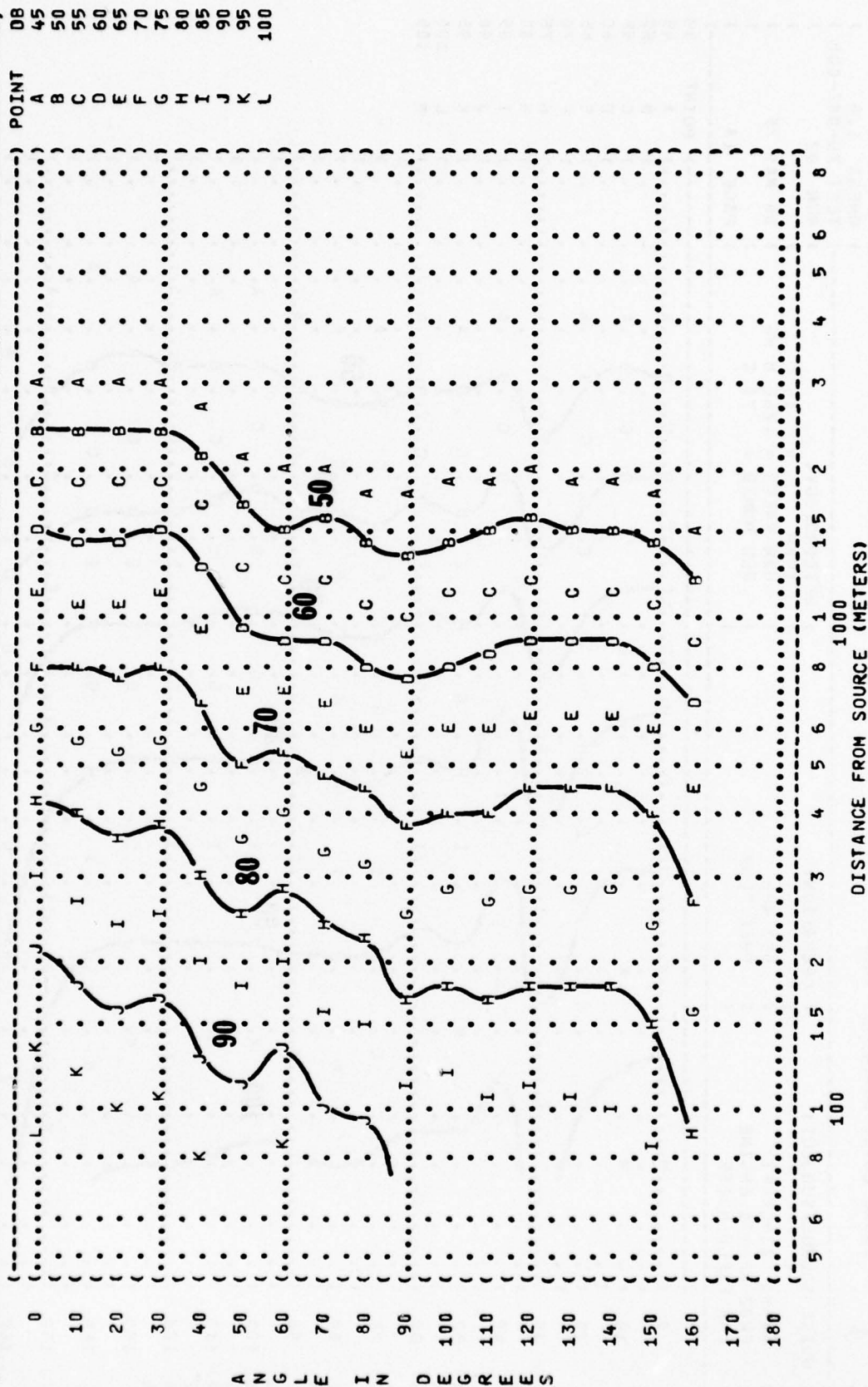


TABLE: DIRECTIVITY INDEX (DB)																
IDENTIFICATION:																
3																
NOISE SOURCE/SUBJECT:																
AV-8A AIRCRAFT																
F402-RR-401 ENGINE																
FAR FIELD NOISE																
OPERATION:																
IDLE																
27% RPM																
FREE FLOW																
METEOROLOGY:																
TEMP = 18 C																
BAR PRESS = .766 M HG																
REL HUMID = 58 %																
PAGE 4																
TEST 75-002-006																
RUN 01																
OMEGA 1.4																
FREQ																
(HZ)																
ANGLE (DEGREES)																
1/3 OCTAVE																
25	1	-4	-1	-5	2	1	-2	-1	5	-3	-2	-1	-1	-1	-1	-2
31.5	-1	-2	-2	-3	-1	-1	-1	1	2	-2	-1	1	1	2	2	-1
40	-2	-2	-2	-3	-1	-1	-1	0	0	-3	-1	1	2	2	2	-1
50	-1	-1	-1	-1	-2	-0	-0	-1	-0	-1	-1	-1	-1	2	2	0
63	0	1	1	1	0	0	-1	-0	-5	-5	-3	-1	0	3	3	1
80	0	1	1	2	-0	-2	-4	-7	-6	-4	-3	-0	2	4	4	-2
100	0	0	0	-0	-3	-2	1	1	2	2	-0	-2	-3	-1	1	2
125	-1	-1	-1	-0	-1	-1	1	0	-3	-4	-2	1	1	4	0	-6
160	1	2	2	3	2	-1	-1	-3	-3	-4	-2	1	3	4	1	-11
200	-1	-1	-0	1	-0	-4	-5	-2	-2	-3	-1	2	2	5	2	0
250	-0	0	1	2	-1	-4	-5	-5	-4	-4	0	2	3	5	2	-1
315	-0	2	1	3	-0	-1	-1	-1	-4	-5	-1	1	1	4	2	-3
400	0	3	2	1	-2	-1	-1	-1	-2	-2	-1	1	0	2	4	-6
500	1	4	3	3	1	1	0	-1	-3	-1	2	2	0	-1	-5	-11
630	2	4	3	3	1	0	-0	-2	-4	-2	1	2	0	-1	-2	-12
800	1	7	6	5	2	2	1	-3	-4	-3	-1	0	-1	-5	-6	-15
1000	7	6	6	5	3	0	0	-1	-3	-3	-1	-0	-1	-4	-6	-17
1250	9	8	8	9	6	-3	-8	-2	-13	-8	-4	-10	-3	-7	-14	-19
1600	9	7	6	6	4	1	3	-2	-2	-3	-8	-5	-5	-7	-13	-21
2000	7	6	6	6	4	3	1	-1	-2	-3	-2	-2	-5	-6	-11	-20
2500	5	7	5	6	4	3	1	0	-4	-4	-4	-5	-5	-7	-8	-22
3150	6	6	6	4	3	4	3	0	-3	-2	-5	-7	-8	-9	-13	-22
4000	10	8	4	3	-1	1	5	2	2	-5	-5	-7	-8	-11	-16	-24
5000	6	5	4	6	4	3	4	0	-2	-4	-3	-5	-7	-9	-12	-24
6300	7	5	6	4	4	2	0	-1	-2	-4	-3	-5	-7	-10	-14	-24
8000	7	6	6	4	4	2	0	-0	-1	-2	-1	-1	-2	-6	-11	-21
10000	7	6	5	5	4	2	1	-1	-1	-3	-1	-2	-3	-6	-7	-22
OCTAVE																
31.5	-2	-2	-2	-3	-0	-1	-1	0	2	-3	-1	1	1	1	2	-0
63	0	1	0	0	-0	-1	-1	-2	-3	-3	-2	-1	0	3	4	0
125	-0	0	0	1	-1	-1	0	0	0	-0	-1	0	0	1	1	-8
250	-0	1	1	2	-0	-3	-3	-2	-3	-4	-1	1	2	5	2	-14
500	1	4	3	2	0	-0	-0	-1	-3	-2	1	2	1	0	2	-6
1000	8	8	8	9	5	-2	-6	-2	-10	-7	-7	-3	-7	-12	-12	-19
2000	7	7	5	6	4	3	2	-1	-3	-3	-4	-5	-5	-7	-7	-21
4000	9	7	4	4	1	2	5	1	1	-4	-6	-7	-10	-11	-15	-24
8000	7	6	6	4	4	2	0	-1	-2	-4	-4	-1	-3	-6	-6	-21
OVERALL																
8	7	5	5	5	3	1	3	0	-1	-4	-3	-4	-4	-5	-5	-12



TABLE: DIRECTIVITY INDEX (DB)																	IDENTIFICATION:		
3																	OMEGA 1.4		
NOISE SOURCE/SUBJECT: ( OPERATION: ) METEOROLOGY: = 18 C																	TEST 75-002-006		
AV-8A AIRCRAFT ( 55% RPM ) BAR PRESS = .766 M HG																	RUN 02		
F402-RR-401 ENGINE ( FREE FLOW ) REL HUMID = 58 %																	06 MAY 75		
FAR FIELD NOISE ( )																	PAGE 4		
FREQ (HZ)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ANGLE (DEGREES)																			
1/3 OCTAVE																			
25	-5	-6	-4	-9	-3	-1	0	-0	-1	-0	-2	1	-0	1	2	4	4	4	4
31.5	-6	-6	-4	-9	-2	-1	-0	1	-0	-1	-2	1	0	2	2	3	4	4	2
40	-5	-5	-5	-9	-3	-2	0	0	-0	-2	0	0	-0	2	2	3	4	4	1
50	-5	-4	-3	-8	-3	-3	-1	-1	-2	-2	-1	0	0	2	3	4	3	3	-1
63	-3	-3	-3	-7	-2	-2	-2	-1	-1	-2	-0	1	2	3	4	5	2	2	-4
80	-3	-3	-3	-7	-2	-3	-4	-3	-3	-1	-0	0	3	4	5	3	3	3	-8
100	-3	-4	-4	-8	-3	-2	-1	-0	-0	-1	-0	-0	1	3	4	4	1	1	-13
125	-1	-1	-1	-5	-1	-0	-2	-3	-4	-3	1	2	3	3	4	4	-1	-1	18
160	-0	1	1	-3	2	1	-1	-2	-3	-3	-1	1	3	3	3	2	-2	-2	22
200	1	1	1	-3	0	-1	-2	-2	-2	-1	0	1	3	3	3	1	-4	-4	25
250	1	1	1	-2	-1	-3	-3	-4	-2	-2	2	2	4	3	-1	-4	-4	-4	26
315	-1	-1	-1	-5	-2	-2	-2	-1	-3	-2	1	2	2	5	-2	-6	-6	-6	26
400	0	1	1	-4	-2	-1	-1	-1	-1	-1	2	2	2	3	-0	-5	-5	-5	25
500	-0	2	1	-4	-0	-1	-1	-3	-2	0	2	1	2	2	1	-4	-4	-4	25
630	1	3	1	-4	1	0	-1	-3	-2	-1	2	2	2	0	0	-1	-4	-4	24
800	2	3	1	-2	0	-0	0	-1	-1	1	3	2	0	0	-1	-5	-5	-5	25
1000	3	2	1	-4	1	1	0	-0	-0	2	3	1	-3	-4	-4	-4	-4	-4	26
1250	5	3	2	-5	3	1	0	0	-0	2	2	2	-4	-4	-5	-5	-5	-5	26
1600	7	4	-0	-6	9	-1	3	-3	1	-2	-4	-3	-7	-11	-8	-10	-10	-10	32
2000	6	5	3	-2	4	3	1	1	-1	1	0	-1	-4	-7	-7	-9	-9	-9	28
2500	7	9	4	-0	5	2	3	0	-2	-0	-2	-3	-6	-9	-10	-10	-10	-10	31
3150	7	7	5	0	4	3	2	1	1	1	-0	-3	-6	-8	-7	-10	-10	-10	29
4000	6	4	4	2	4	4	3	2	-0	0	-1	-3	-7	-8	-9	-13	-13	-13	32
5000	3	4	4	-2	3	3	2	2	-0	1	1	-2	-3	-7	-8	-12	-12	-12	32
6300	3	4	4	-3	2	2	3	1	-1	1	1	-1	-3	-5	-7	-11	-11	-11	31
8000	4	4	3	-3	3	2	2	3	-0	2	1	-2	-4	-7	-8	-12	-12	-12	32
10000	4	4	4	-3	3	2	2	2	-1	1	1	-2	-4	-6	-8	-12	-12	-12	33
OCTAVE																			
31.5	-5	-5	-4	-9	-3	-2	-0	0	-0	-1	-1	0	-0	2	3	5	4	2	2
63	-3	-3	-3	-7	-2	-3	-2	-2	-2	-2	-0	1	2	3	3	3	3	-4	2
125	-1	-1	-1	-5	-0	-0	-1	-2	-2	-2	0	1	2	4	4	-1	-5	-16	2
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500	0	2	1	-4	-0	-1	-1	-2	-2	-0	2	2	2	-2	-3	-5	-5	-5	25
1000	3	3	1	-4	2	0	0	-0	-1	1	3	1	-2	-2	-3	-5	-5	-5	26
2000	7	7	2	-3	7	1	3	-1	0	-1	-3	-3	-6	-10	-9	-10	-10	-10	31
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8000	4	4	3	-3	2	2	2	2	-1	1	1	-1	-3	-6	-7	-12	-12	-12	32
OVERALL																			
4	4	4	2	-3	4	1	1	-0	-1	-0	0	-0	-1	-1	-2	-4	-4	-12	2

```
(-----) IDENTIFICATION: )  
FIGURE: OVERALL SOUND PRESSURE LEVEL {OASPL}  
EQUAL LEVEL CONTOURS (DB)  
    4  
  
(-----) METEOROLOGY:  
NOISE SOURCE/SUBJECT:   OPERATION:  
(      AV-8A AIRCRAFT     IDLE          TEMP = 15 C  
(      F402-RR-401 ENGINE  27% RPM       BAR PRESS = .760 M HG  
(      FAR FIELD NOISE     FREE FLOW      REL HUMID = 70 %  
(                                     )  
(                                     ) PAGE 13
```



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( ( FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)
( ( 4
( ( EQUAL LEVEL CONTOURS (DB)
( (
( ( NOISE SOURCE/SUBJECT: ( OPERATION: ( METEOROLOGY:
( ( AV-8A AIRCRAFT ( 55% RPM ( TEMP = 15 C
( ( F402-RR-401 ENGINE ( FREE FLOW ( BAR PRESS = .760 M HG
( ( FAR FIELD NOISE ( ( REL HUMID = 70 %
( (
( ( IDENTIFICATION:
( ( )
( ( )
( ( OMEGA 1.4
( ( TEST 75-002-006
( ( RUN 02
( ( )
( ( )
( ( ) 06 MAY 75
( ( )
( ( ) PAGE 13
( (

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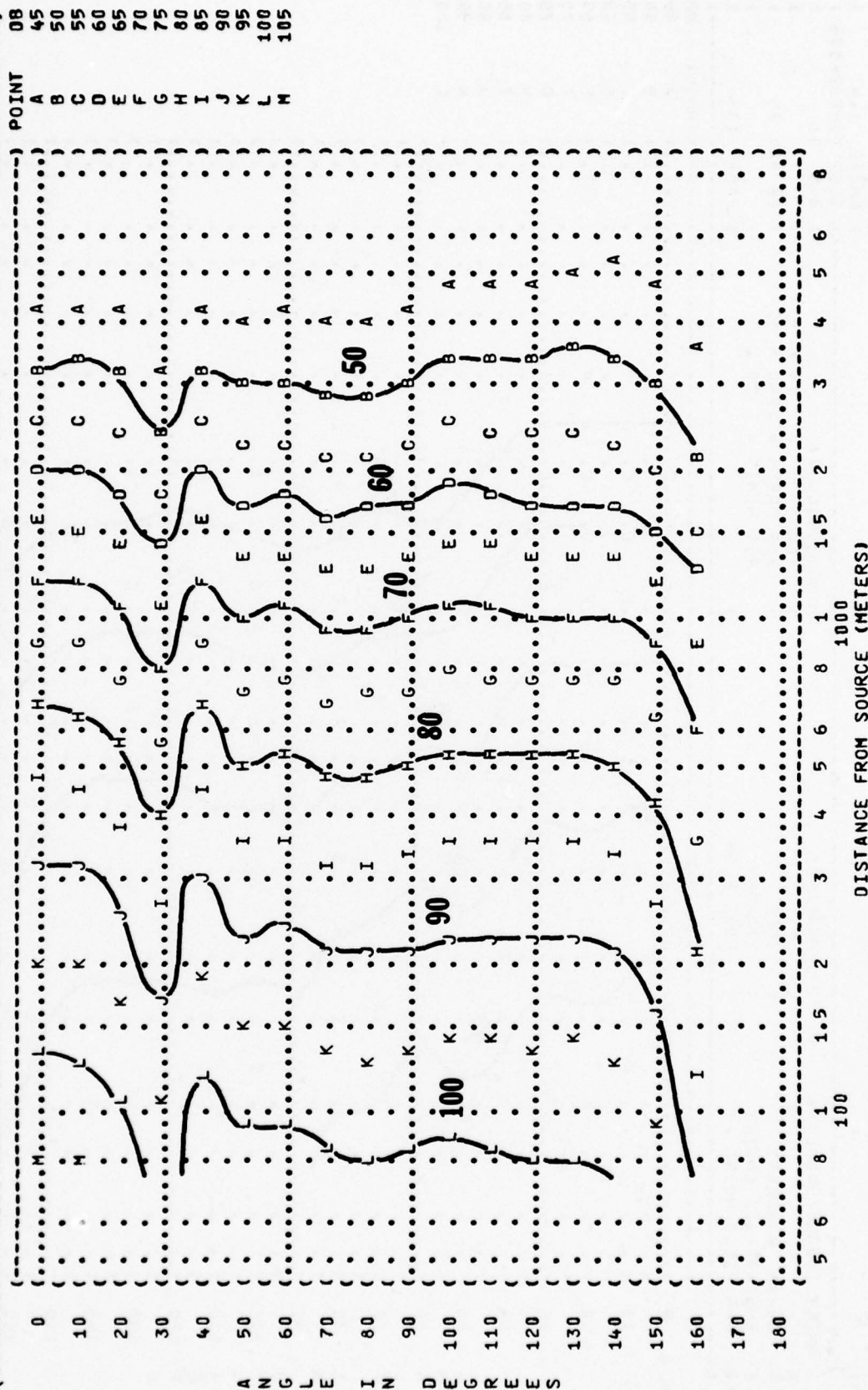




FIGURE: OVERALL SOUND PRESSURE LEVEL (OASPL)  
EQUAL LEVEL CONTOURS (DB)

**( OPERATION:**

## ● METEOROLOGY:

TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

## POINT

(—)

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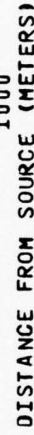
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10



OVERALL SOUND PRESSURE LEVEL {OASPL}  
EQUAL LEVEL CONTOURS (DB)

IDENTIFICATION:

**OMEGA 1.4**

TEST 75-002-006

), RUN 04

—

06 MAY 75

—

) PAGE 13

## METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

### OPERATION:

100 F00

95% RPM

NOISE SOURCE/SUBJECT:

AV-8A AIRCRAFT

F402-RR-401 ENG

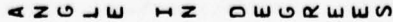
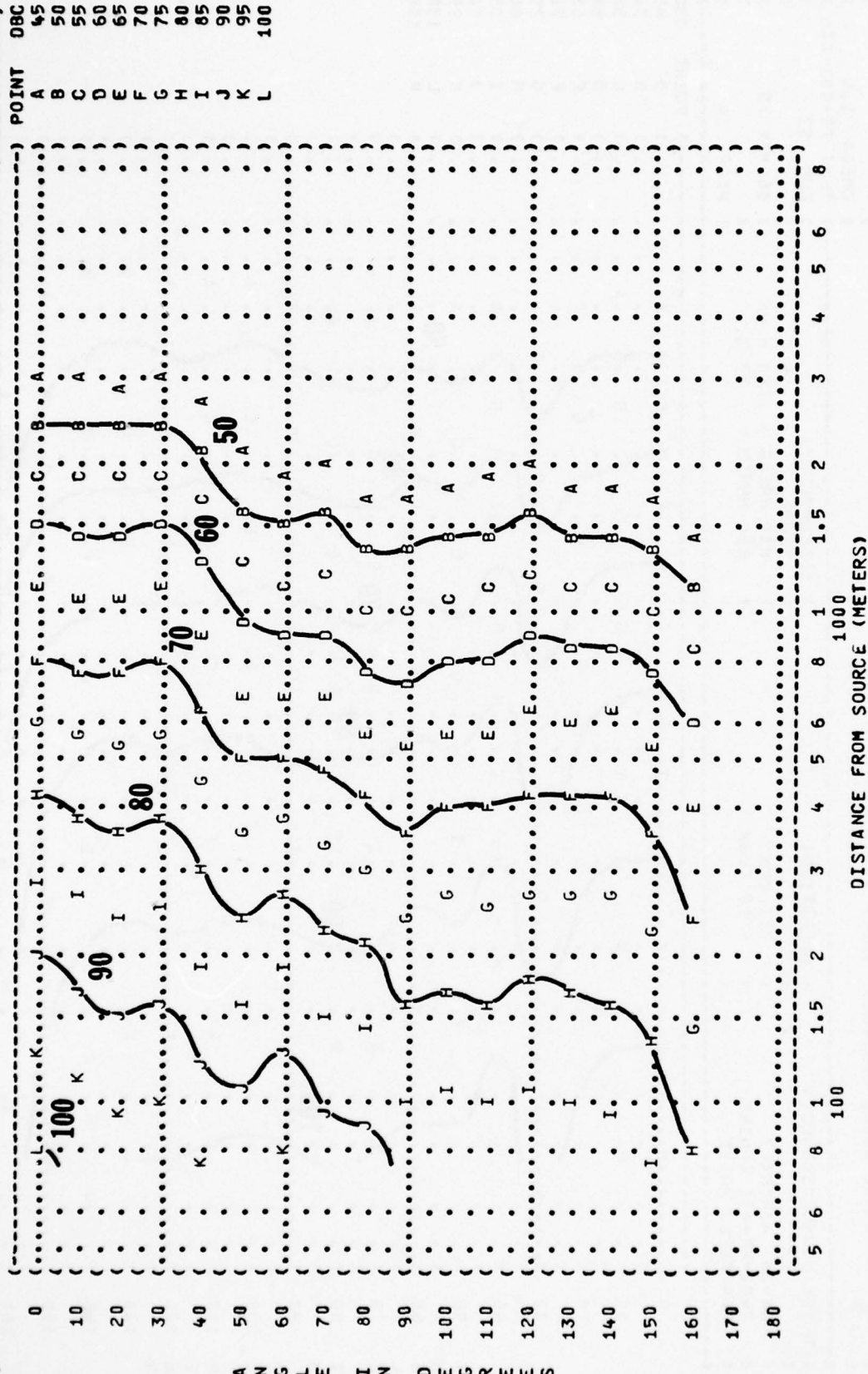


FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (OASLC)

5 EQUAL LEVEL CONTOURS (DBC)

NOISE SOURCE/SUBJECT: ( OPERATION: ) METEOROLOGY: )  
 ( AV-8A AIRCRAFT ( IDLE ) TEMP = 15 C )  
 ( F402-RR-401 ENGINE ( 27% RPM ) BAR PRESS = .760 M HG )  
 ( FAR FIELD NOISE ( FREE FLOW ) REL HUMID = 70 % )

IDENTIFICATION: )  
 ) OMEGA 1.4  
 ) TEST 75-002-006  
 ) RUN 01  
 ) 06 MAY 75  
 ) PAGE 14

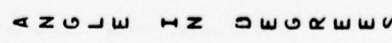


DISTANCE FROM SOURCE (METERS)

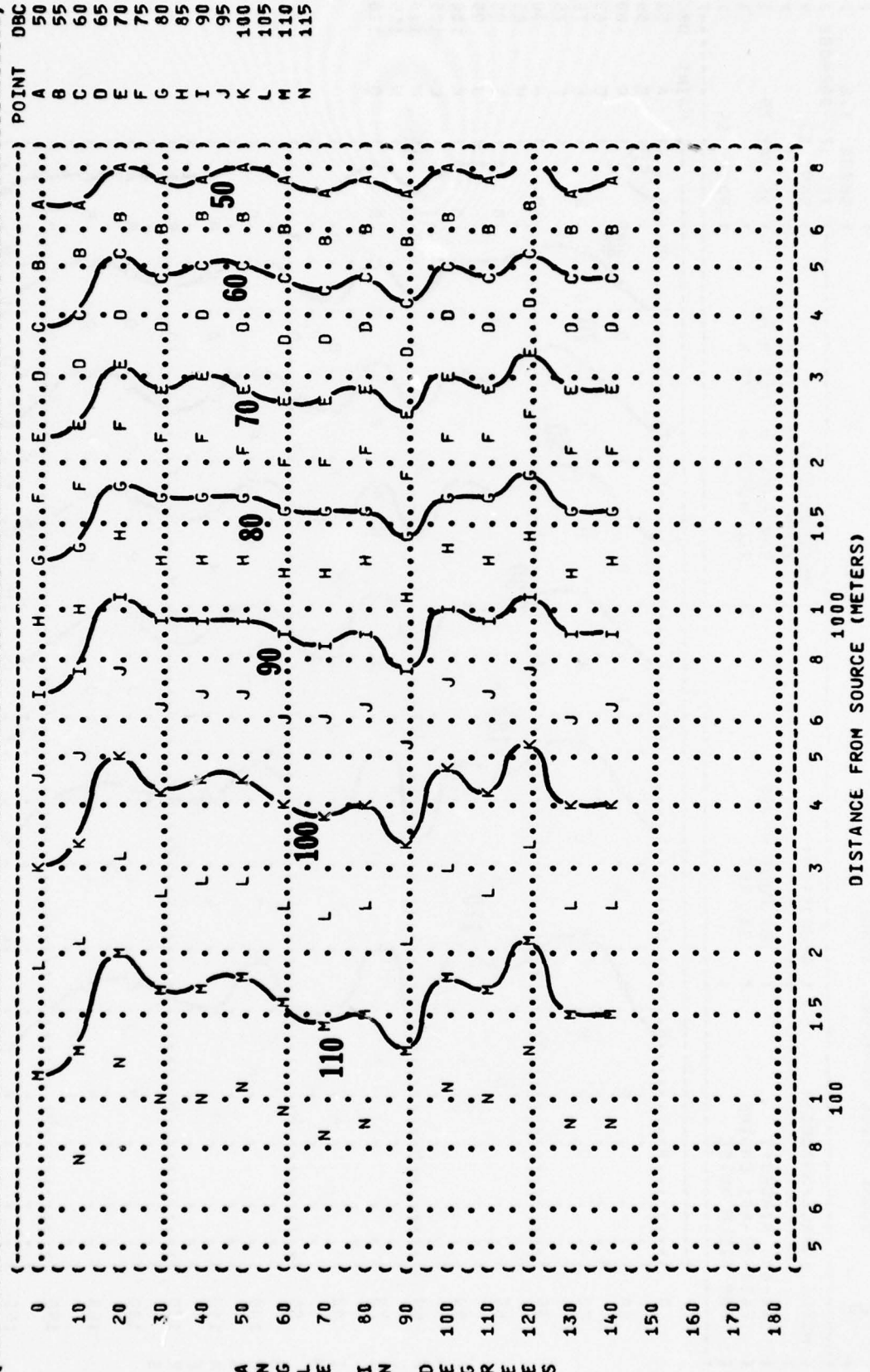




POINT	DBC
A	50
B	55
C	60
D	65
E	70
F	75
G	80
H	85
I	90
J	95
K	100
L	105
M	110
N	115
O	120

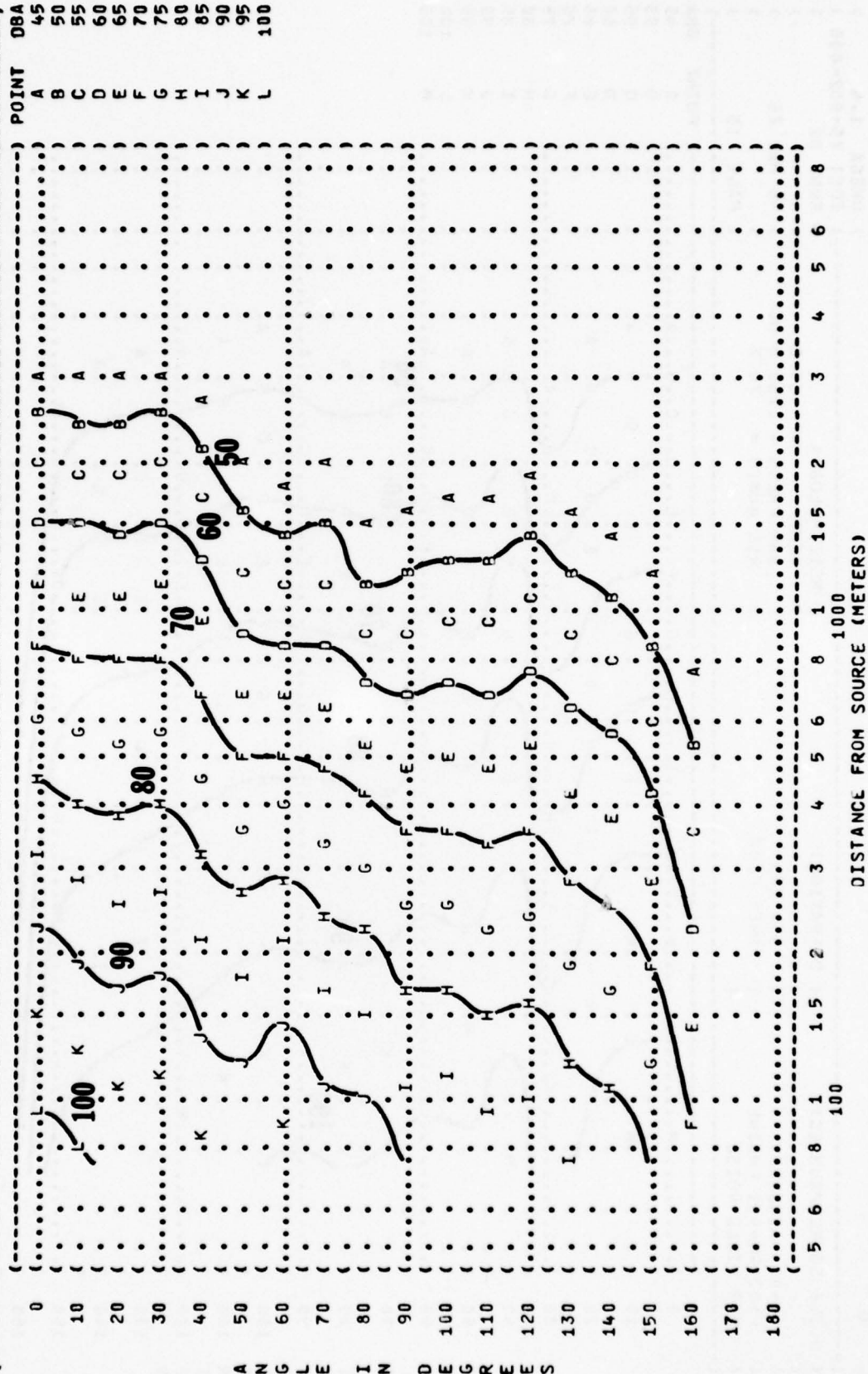


( FIGURE: C-WEIGHTED OVERALL SOUND LEVEL (OASLC) )  
 ( 5 )  
 ( NOISE SOURCE/SUBJECT: )  
 ( AV-8A AIRCRAFT )  
 ( F402-RR-401 ENGINE )  
 ( FAR FIELD NOISE )  
 ( OPERATION: )  
 ( 100 FOOT HOVER )  
 ( 95% RPM )  
 ( METEOROLOGY: )  
 ( TEMP = 15 C )  
 ( BAR PRESS = .760 M HG )  
 ( REL HUMID = 70 % )  
 ( IDENTIFICATION: )  
 ( OMEGA 1.4 )  
 ( TEST 75-002-006 )  
 ( RUN 04 )  
 ( 06 MAY 75 )  
 ( PAGE 14 )





( FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)  
 ( 6  
 ( EQUAL LEVEL CONTOURS (DBA)  
 ( ) IDENTIFICATION:  
 ( ) OMEGA 1.4  
 ( ) TEST 75-002-006  
 ( ) RUN 01  
 ( NOISE SOURCE/SUBJECT: ( OPERATION:  
 ( ) METEOROLOGY:  
 ( ) TEMP = 15 C  
 ( ) BAR PRESS = .760 M HG  
 ( ) REL HUMID = 70 %  
 ( ) AV-8A AIRCRAFT  
 ( ) F402-RR-401 ENGINE  
 ( ) FAR FIELD NOISE  
 ( ) FREE FLOW  
 ( ) 06 MAY 75  
 ( ) PAGE 15



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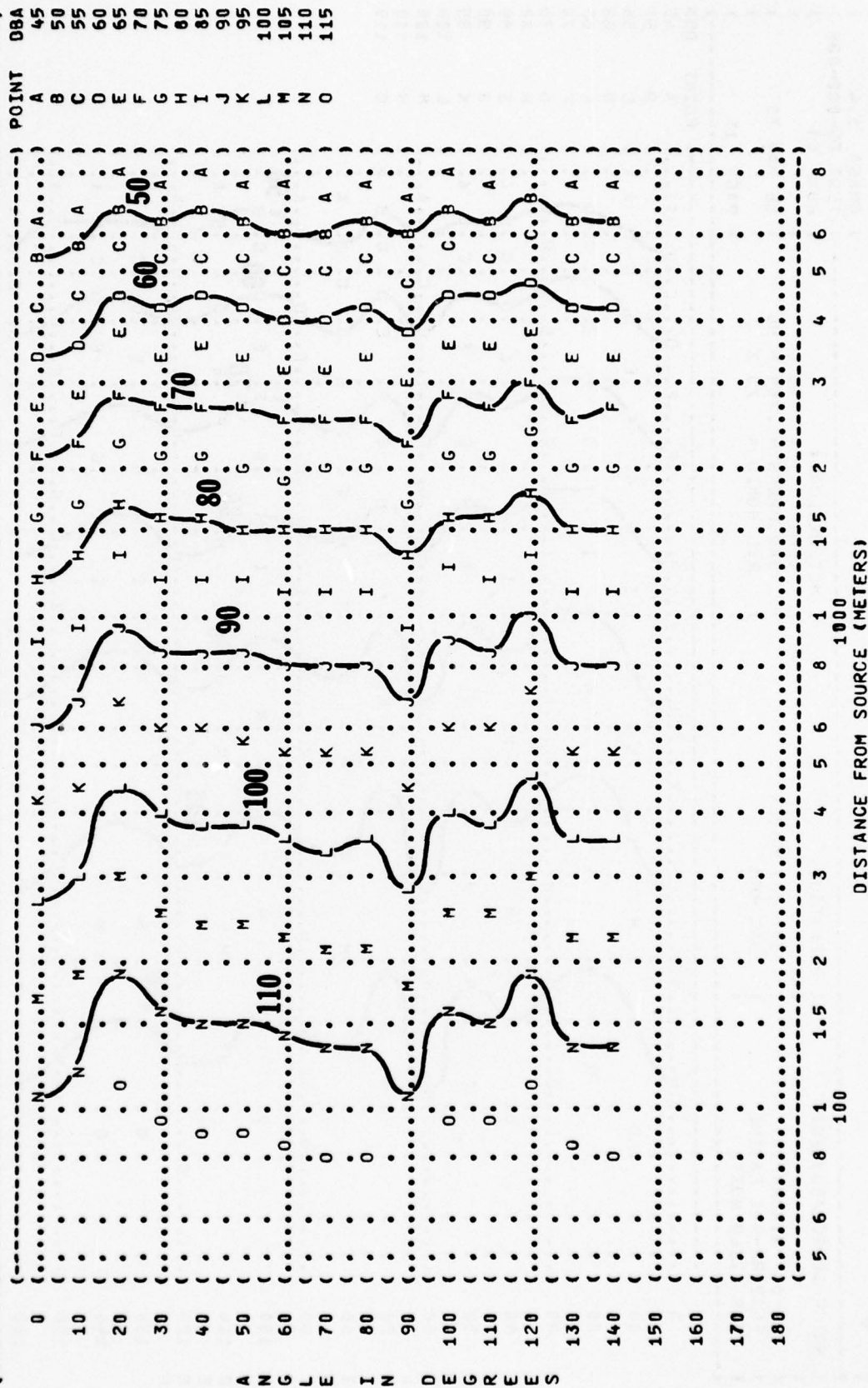


FIGURE: A-WEIGHTED OVERALL SOUND LEVEL (OASLA)  
 6  
 EQUAL LEVEL CONTOURS (DBA)

IDENTIFICATION:  
 OMEGA 1.4  
 TEST 75-002-006  
 RUN 04

NOISE SOURCE/SUBJECT: ( OPERATION: ) METEOROLOGY:  
 AV-8A AIRCRAFT ( 100 FOOT HOVER ) TEMP = 15 C  
 F402-RR-401 ENGINE ( 95% RPM ) BAR PRESS = .760 M HG  
 FAR FIELD NOISE ( ) REL HUMID = 70 %

PAGE 15



```
(-----)
( FIGURE# PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION {PNLT} ) IDENTIFICATION: )
(      7 EQUAL LEVEL CONTOURS (PNUB) ) )
( ) OMEGA 1.4 )
( ) TEST 75-002-006 )
(-----)
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 01 )
( ) ) ) )
( AV-8A AIRCRAFT ) TEMP = 15 C ) )
( F402-RR-401 ENGINE ) BAR PRESS = .760 M HG ) 06 MAY 75 )
( FAR FIELD NOISE ) REL HUMID = 70 % ) )
( ) FREE FLOW ) PAGE 16 )
(-----)
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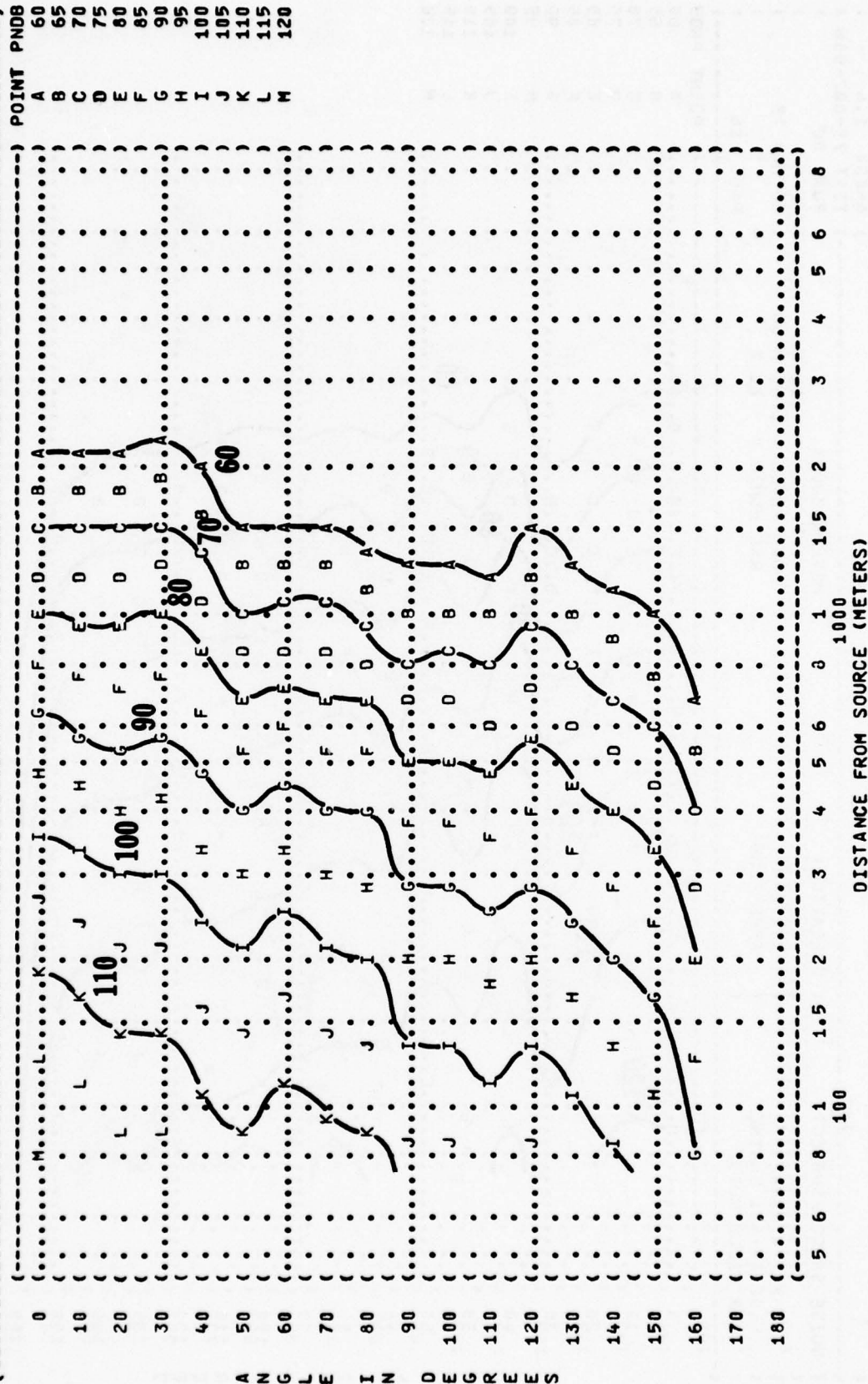






FIGURE 7  
PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION {PNLT}  
EQUAL LEVEL CONTOURS (PNDB)

EQUAL LEVEL CONTOURS (PNDB)

## IDENTIFICATION:

**OMEGA 1.4**

TEST 75-002-006

03 RUN

•

PAGE 16

## METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

### OPERATION:

50 FOOT HOVER

98% RPM

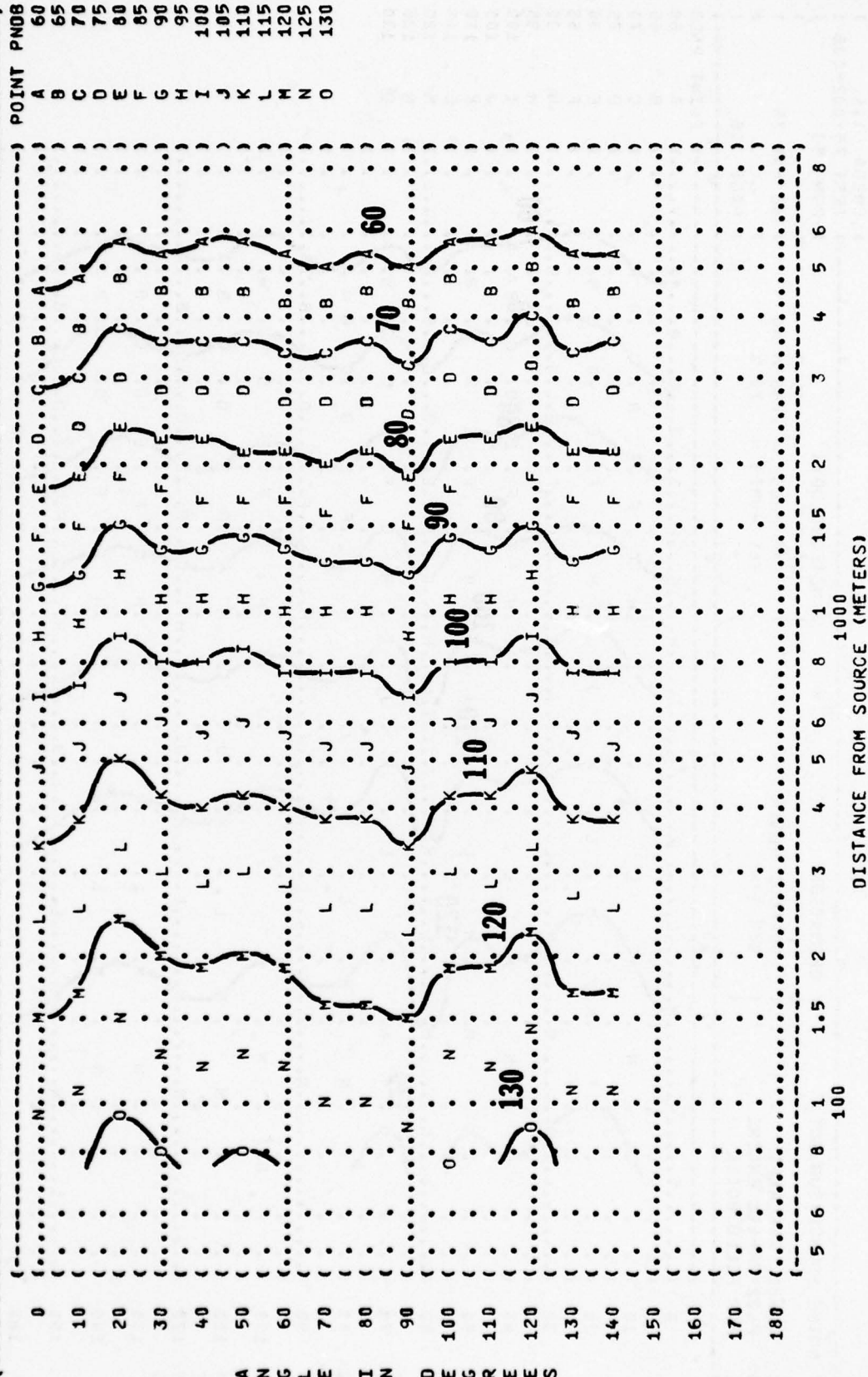
**NOISE SOURCE/SUBJECT:**

AV-8A AIRCRAFT  
F402-RR-401 ENGINE  
FAR FIELD NOISE

ANGLE IN DEGREES

DISTANCE FROM SOURCE (METERS)

( FIGURE: PERCEIVED NOISE LEVEL WITH SMOOTH TONE CORRECTION {PNLT}  
 ( 7  
 ( EQUAL LEVEL CONTOURS {PNDB}  
 ( NOISE SOURCE/SUBJECT: ( OPERATION: ( METEOROLOGY: ( IDENTIFICATION: )  
 ( AV-8A AIRCRAFT ( 100 FOOT HOVER ( TEMP = 15 C ( OMEGA 1.4  
 ( F402-RR-401 ENGINE ( 95% RPM ( BAR PRESS = .760 M HG ( TEST 75-002-006  
 ( FAR FIELD NOISE ( ( REL HUMID = 70 % ( RUN 04  
 ( ( ( ( ( PAGE 16  
 (







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(-----)
( FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL) )
(      8      EQUAL LEVEL CONTOURS (DB) )
( )
( )
( ) OMEGA 1.4 )
( TEST 75-002-006 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 02 )
( ) ) )
( AV-8A AIRCRAFT ) TEMP = 15 C ) )
( F402-RR-401 ENGINE ) BAR PRESS = .760 M HG ) )
( FAR FIELD NOISE ) REL HUMID = 70 % ) )
( ) ) )
( ) PAGE 17 )
(-----)
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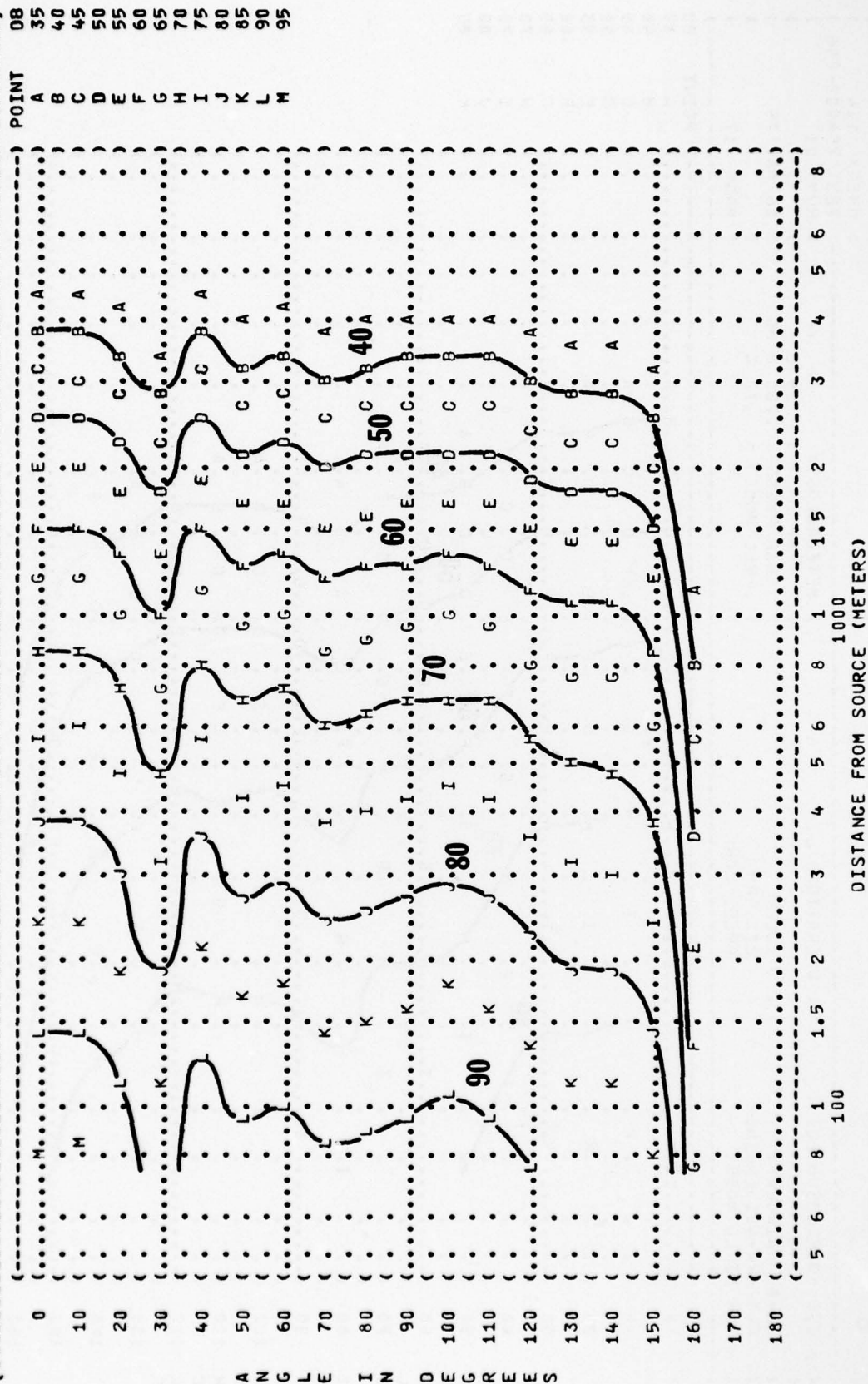
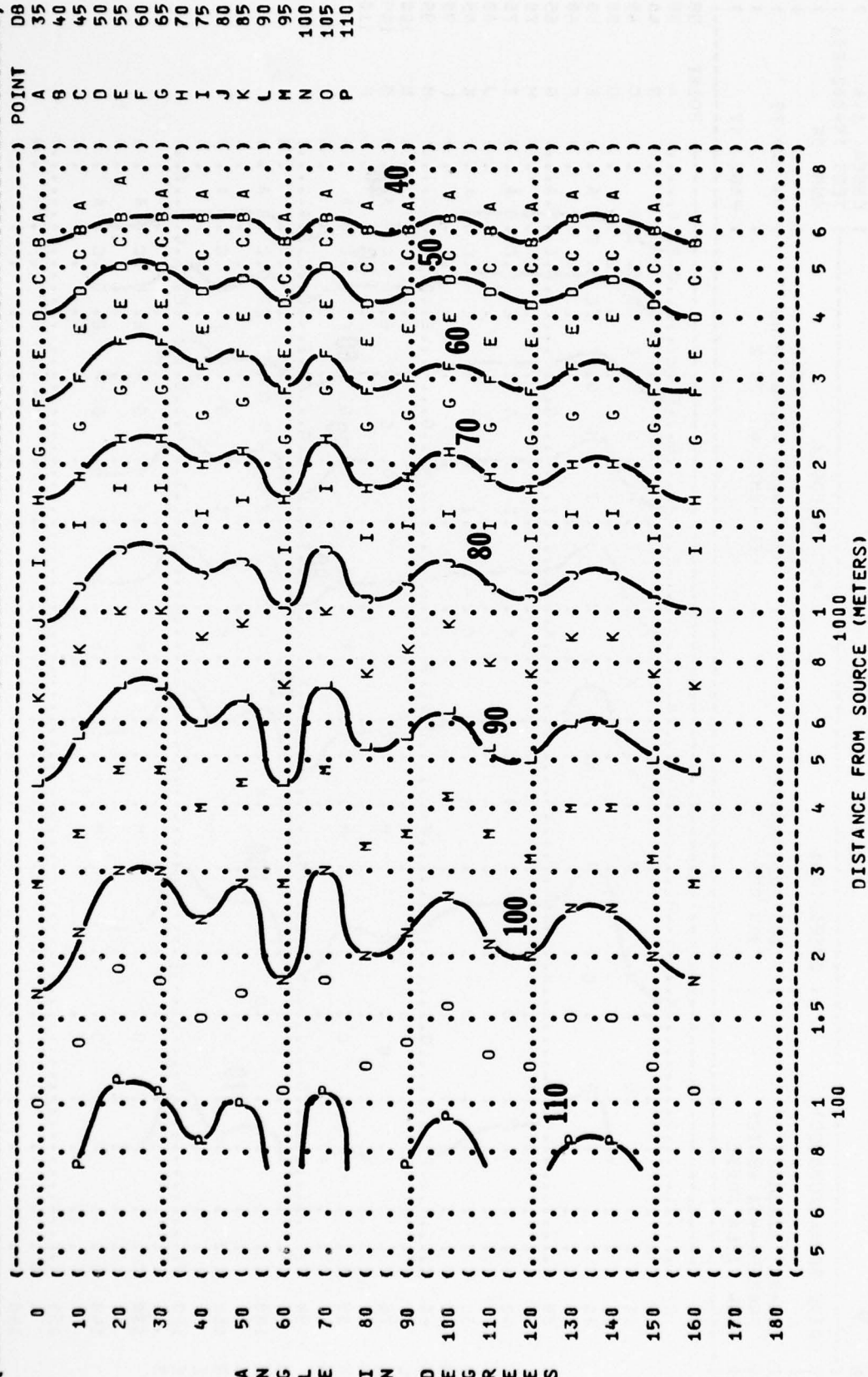
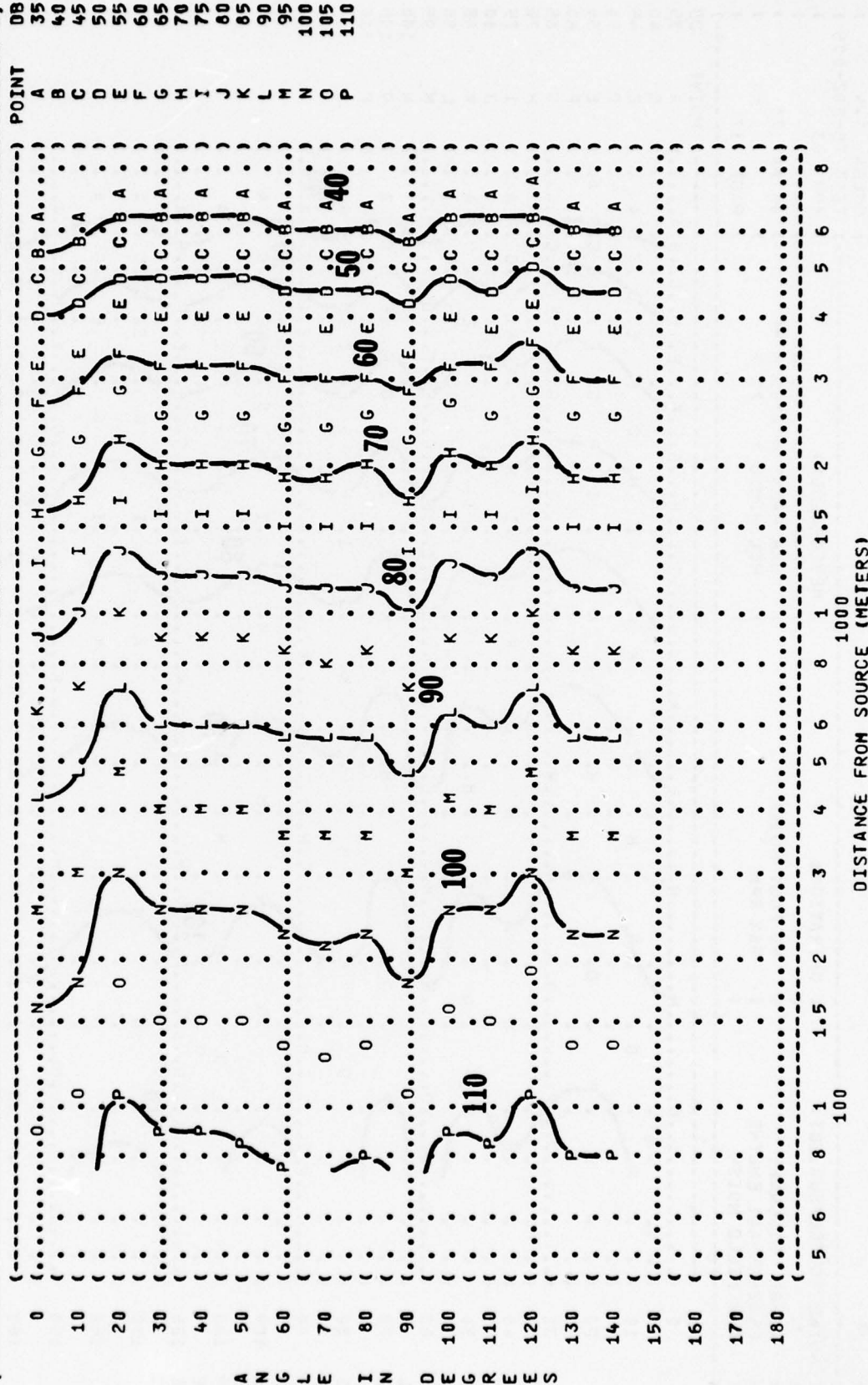


FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL) EQUAL LEVEL CONTOURS (DB)		IDENTIFICATION:	
8			
			OMEGA 1.4
			TEST 75-002-006
			RUN 03
NOISE SOURCE/SUBJECT:		METEOROLOGY:	
	AV-8A AIRCRAFT	TEMP	15 C
	F402-RR-401 ENGINE	BAR PRESS	.760 M HG
	FAR FIELD NOISE	REL HUMID	70 %
			PAGE 17



( FIGURE: PREFERRED SPEECH INTERFERENCE LEVEL (PSIL) )  
 ( 8 )  
 ( ) IDENTIFICATION: )  
 ( ) OMEGA 1.4 )  
 ( ) TEST 75-002-006 )  
 ( ) RUN 04 )  
 ( NOISE SOURCE/SUBJECT: )  
 ( ) OPERATION: )  
 ( ) TEMP = 15 C )  
 ( ) BAR PRESS = .760 M HG )  
 ( ) REL HUMID = 70 % )  
 ( ) 06 MAY 75 )  
 ( ) PAGE 17 )  
 ( )



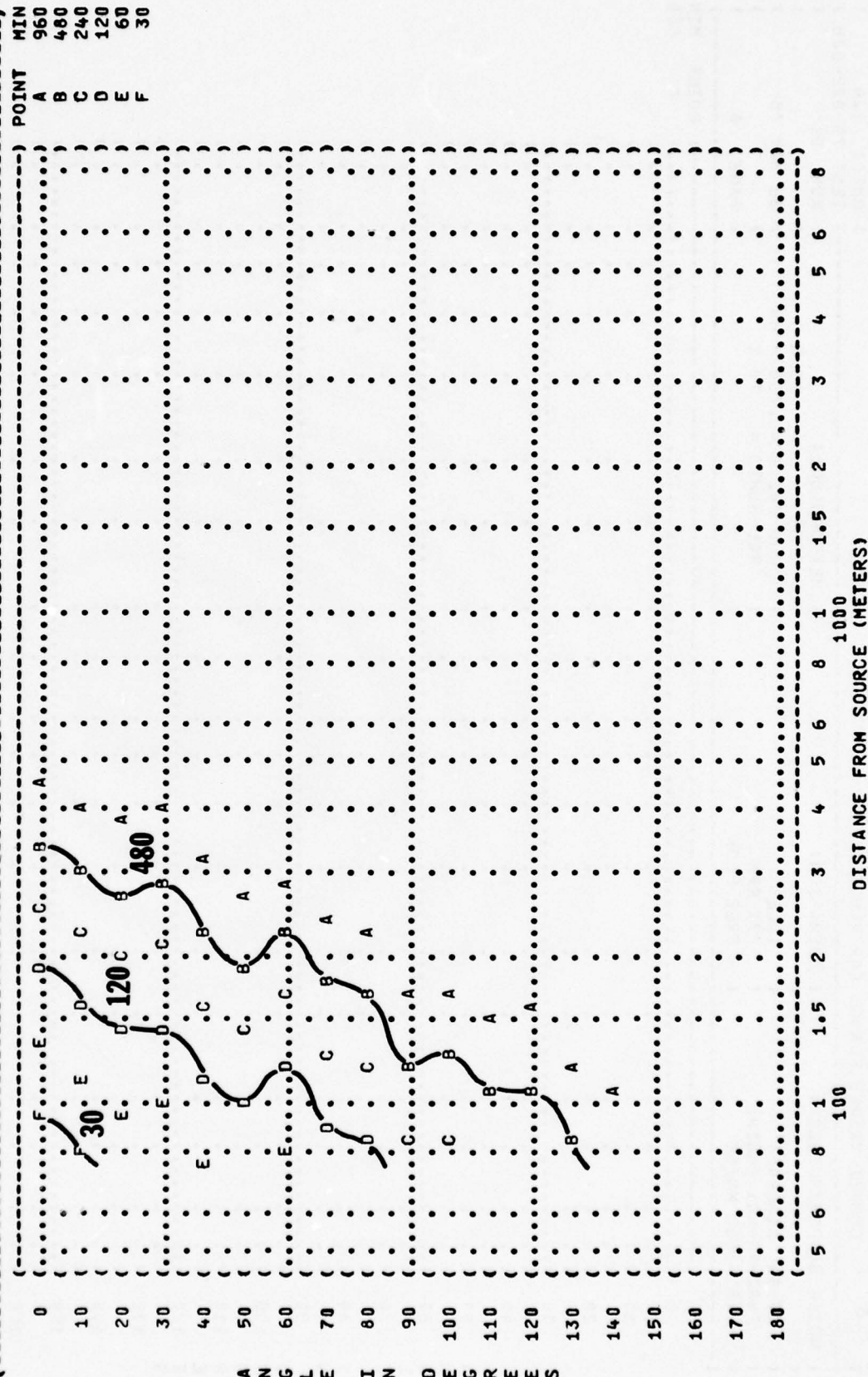
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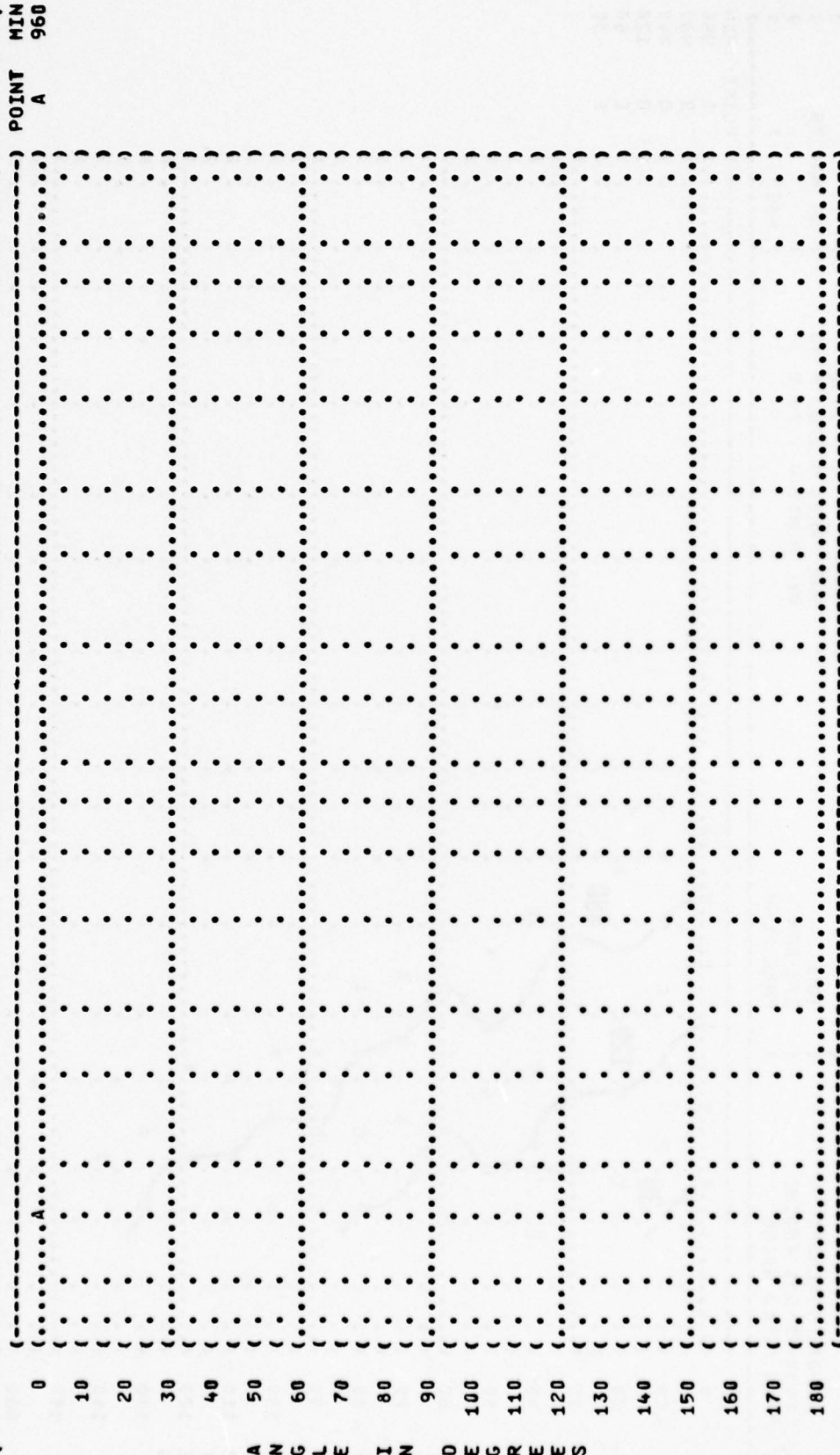
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( ( FIGURE: MAXIMUM PERMISSIBLE TIME {T} FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
( ( 9 EQUAL TIME CONTOURS (MINUTES) ) )
( ( NO PROTECTION ) OMEGA 1.4 )
( ( ) TEST 75-002-006 )
( ( NOISE SOURCE/SUBJECT: ) OPERATION: ) METEOROLOGY: ) RUN 01 )
( ( AV-8A AIRCRAFT ) IDLE ) TEMP = 15 C ) )
( ( F402-RR-401 ENGINE ) 27% RPM ) BAR PRESS = .760 M HG ) )
( ( FAR FIELD NOISE ) FREE FLOW ) REL HUMID = 70 % ) )
( ( ) ) ) PAGE 7 )

```



( ( FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )  
 ( ( 9 EQUAL TIME CONTOURS (MINUTES) ) )  
 ( ( COMFIT TRIPLE FLANGE EAR PLUGS ) )  
 ( ( NOISE SOURCE/SUBJECT: ) OPERATION: ) METEOROLOGY: )  
 ( ( AV-8A AIRCRAFT ) ) TEMP = 15 C )  
 ( ( F402-RR-401 ENGINE ) IDLE ) BAR PRESS = .760 M HG )  
 ( ( FAR FIELD NOISE ) 27% RPM ) REL HUMID = 70 % )  
 ( ( ) FREE FLOW ) ) PAGE 8 )  
 ( ( ) ) ) POINT MIN  
 ( ( ) ) ) A 960



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(-----)
( FIGURE: MAXIMUM PERMISSIBLE TIME {T} FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION: )
(      9      EQUAL TIME CONTOURS (MINUTES) ) )
( ) )
( ) OMEGA 1.4 )
( ) TEST 75-002-006 )
( NOISE SOURCE/SUBJECT: ) OPERATION: ) METEOROLOGY: ) RUN 01 )
( ) ) TEMP = 15 C ) )
( AV-8A AIRCRAFT ) IDLE ) BAR PRESS = .760 M HG ) 06 MAY 75 )
( F402-RR-401 ENGINE ) 27% RPM ) REL HUMID = 70 % ) )
( FAR FIELD NOISE ) FREE FLOW ) ) PAGE 9 )
(-----)
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PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY  
AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS  
FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)  
UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

- MINIMUM QPL EAR MUFFS
- AMERICAN OPTICAL 1700 EAR MUFFS
- V-51R EAR PLUGS
- H-133 GROUND COMMUNICATION UNIT

(-----)

5 6 8 1 1.5 2 3 4 5 6 8 100 1000

DISTANCE FROM SOURCE (METERS)

DISTANCE FROM SOURCE (METERS)



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42

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(-----)
( FIGURE: MAXIMUM PERMISSIBLE TIME (T) FOR ONE EXPOSURE PER DAY (AFR 161-35, JULY 73) ) IDENTIFICATION:
( 9 EQUAL TIME CONTOURS (MINUTES) ) )
( COMF: TRIPLE FLANGE EAR PLUGS ) OMEGA 1.4
(-----)
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) TEST 75-002-006
( ) ) ) RUN 02
( ) ) )
( AV-8A AIRCRAFT ) TEMP = 15 C )
( F402-RR-401 ENGINE ) 55% RPM ) BAR PRESS = .760 M HG ) 06 MAY 75
( FAR FIELD NOISE ) FREE FLOW ) REL HUMID = 70 % )
( ) ) ) ) PAGE 8
(-----)

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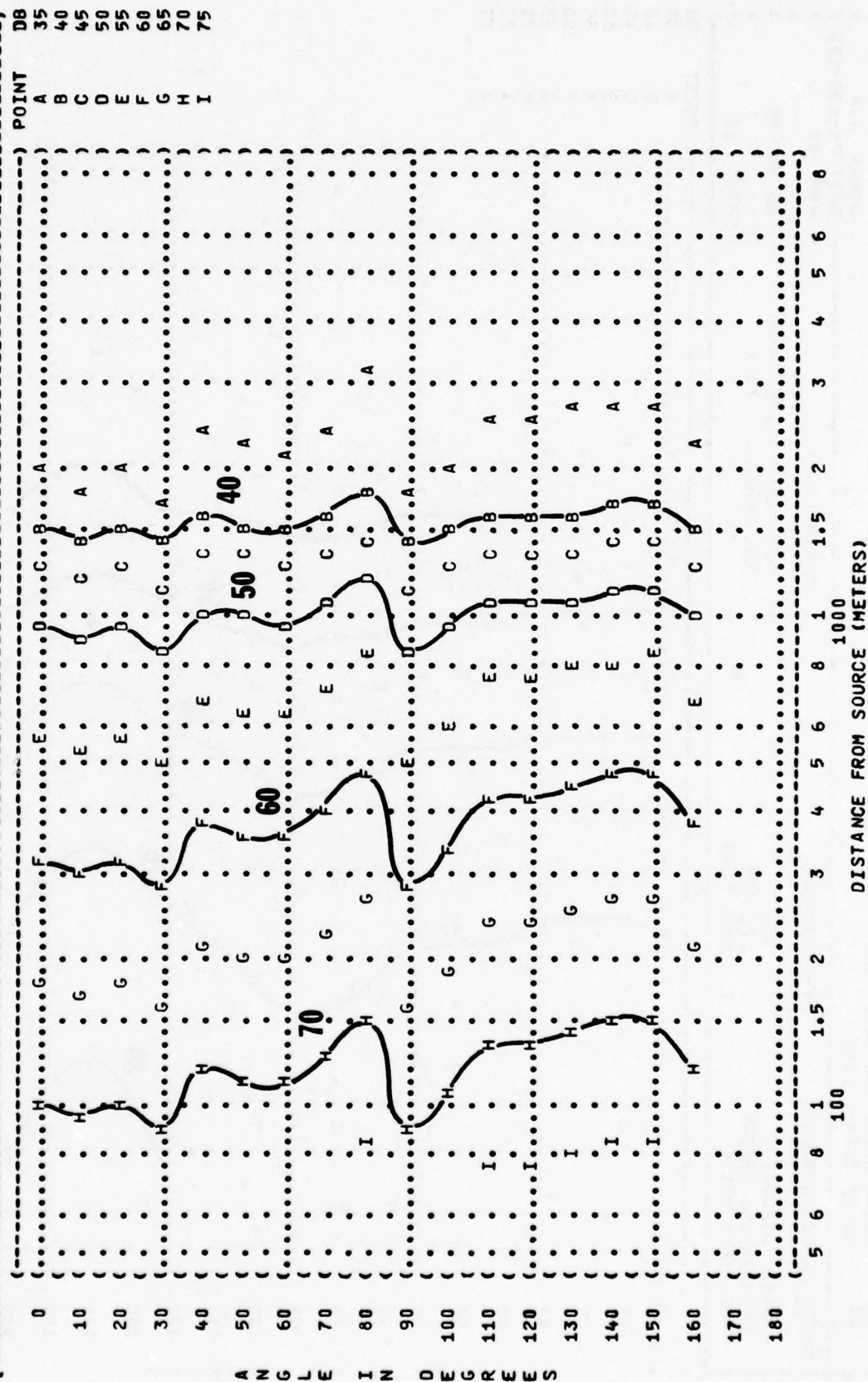
PERSONNEL MAY BE EXPOSED UP TO 960 MINUTES PER DAY  
AT ALL DISTANCES FROM SOURCE EQUAL TO OR GREATER THAN 75 METERS  
FOR ALL ANGLES EVALUATED (INDICATED BY < AT LEFT)  
UNDER THE FOLLOWING EAR PROTECTION CONDITIONS:

MINIMUM QPL EAR MUFFS  
AMERICAN OPTICAL 1700 EAR MUFFS  
V-51R EAR PLUGS  
H-133 GROUND COMMUNICATION UNIT

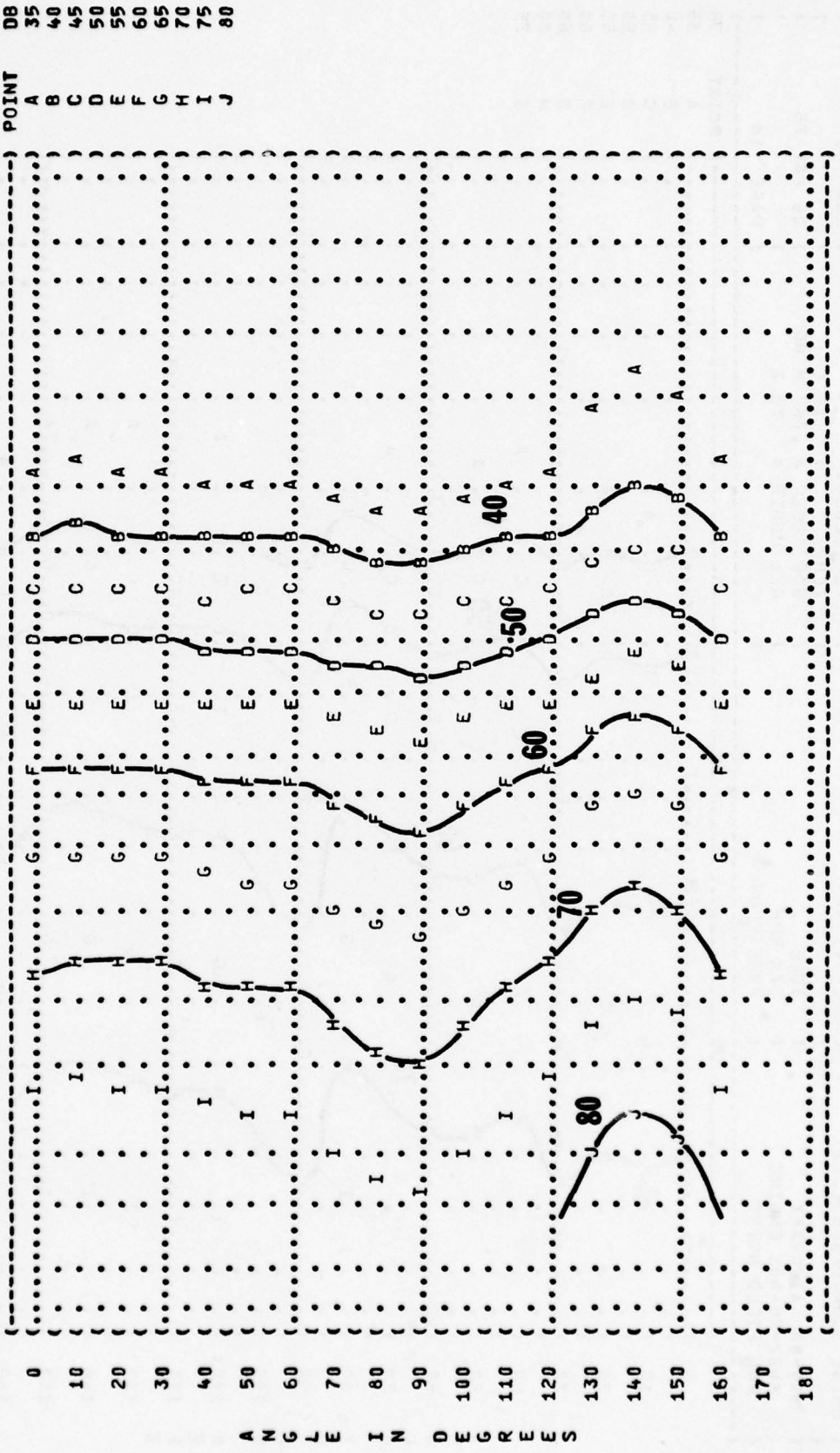
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100 1000  
DISTANCE FROM SOURCE (METERS)



FIGURE:	SOUND PRESSURE LEVEL (SPL)	IDENTIFICATION:
10	EQUAL LEVEL CONTOURS (DB)	
	31.5 HZ OCTAVE BAND	OMEGA 1.4
		TEST 75-002-006
NOISE SOURCE/SUBJECT:	OPERATION:	RUN 01
AV-8A AIRCRAFT	IDLE	TEMP = 15 C
F402-RR-401 ENGINE	27% RPM	BAR PRESS = .760 M HG
FAR FIELD NOISE	FREE FLOW	REL HUMID = 70 %
		PAGE 18



( FIGURE: SOUND PRESSURE LEVEL (SPL)  
 ( EQUAL LEVEL CONTOURS (DB)  
 ( 10 63 HZ OCTAVE BAND  
 ( NOISE SOURCE/SUBJECT: ( OPERATION:  
 ( AV-8A AIRCRAFT ( IDLE  
 ( F402-RR-401 ENGINE ( 27% RPM  
 ( FAR FIELD NOISE ( FREE FLOW  
 ( METEOROLOGY:  
 ( TEMP = 15 C  
 ( BAR PRESS = .760 M HG  
 ( REL HUMID = 70 %  
 ( PAGE 19  
 ( IDENTIFICATION:  
 ( OMEGA 1.4  
 ( TEST 75-002-006  
 ( RUN 01



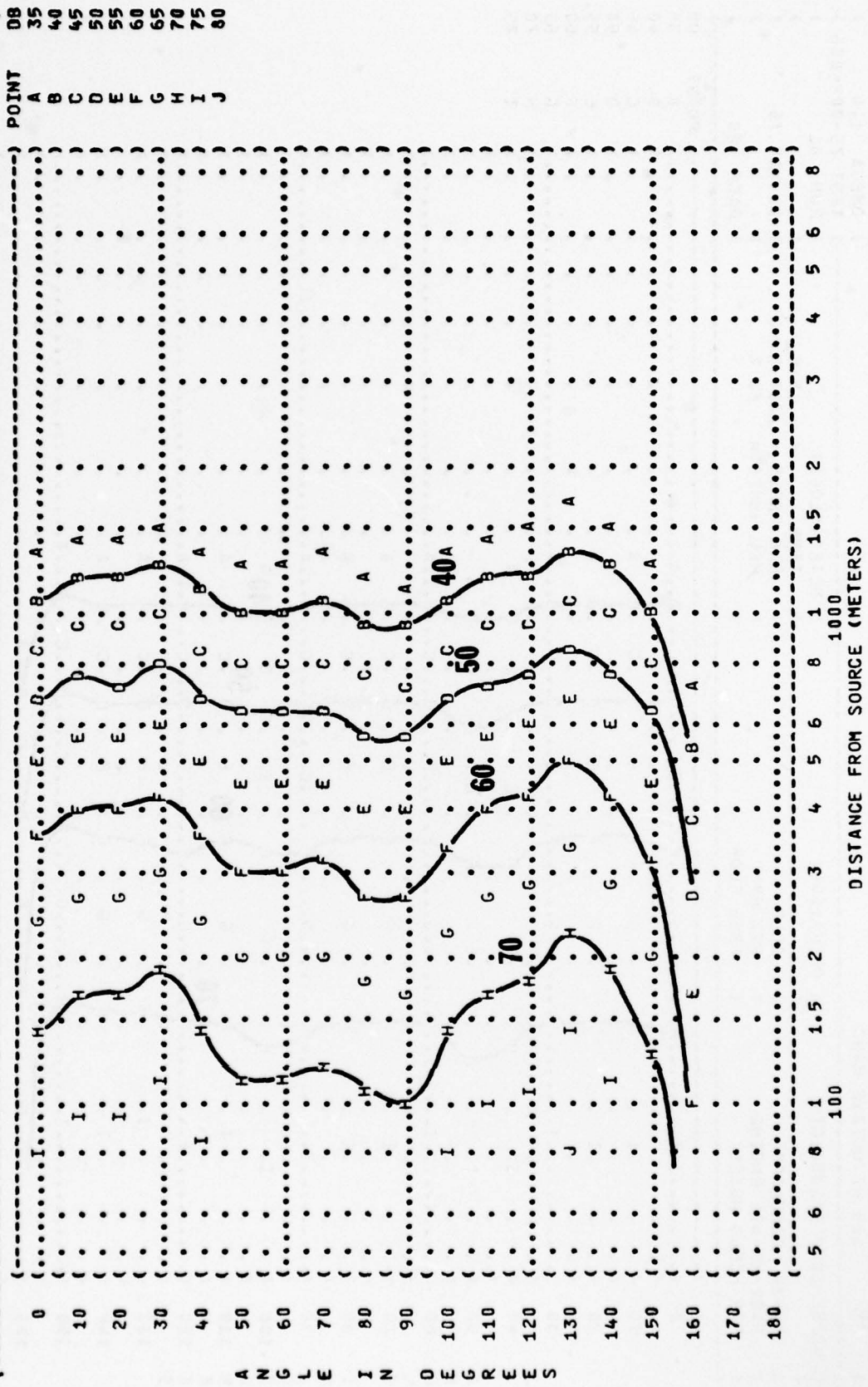
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 POINT A B C D E F G H I J  
 DISTANCE FROM SOURCE (METERS)

( FIGURE: SOUND PRESSURE LEVEL (SPL) ) IDENTIFICATION: )  
 ( 10 EQUAL LEVEL CONTOURS (DB) ) )  
 ( 125 HZ OCTAVE BAND ) )  
 ( NOISE SOURCE/SUBJECT: ) )  
 ( AV-8A AIRCRAFT ) )  
 ( F402-RR-401 ENGINE ) )  
 ( FAR FIELD NOISE ) )  
 ( OPERATION: ) )  
 ( IDLE ) )  
 ( 27% RPM ) )  
 ( FREE FLOW ) )  
 ( METEOROLOGY: ) )  
 ( TEMP = 15 C ) )  
 ( BAR PRESS = .760 M HG ) )  
 ( REL HUMID = 70 % ) )  
 ( RUN 01 ) )  
 ( TEST 75-002-006 ) )  
 ( PAGE 20 ) )

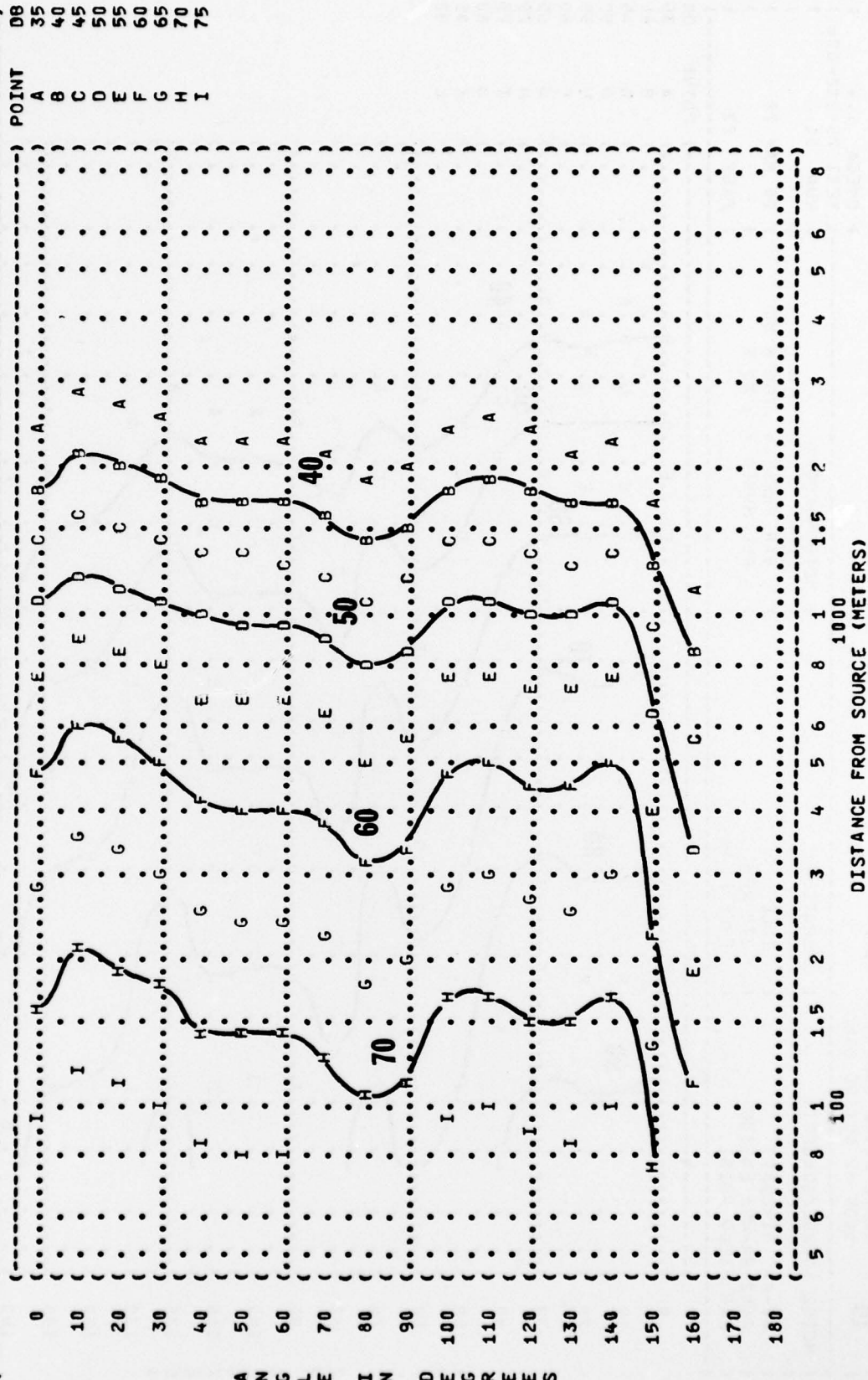




( FIGURE: SOUND PRESSURE LEVEL (SPL) )  
 ( 10 EQUAL LEVEL CONTOURS (DB) )  
 ( 250 HZ OCTAVE BAND )  
 ( NOISE SOURCE/SUBJECT: )  
 ( AV-8A AIRCRAFT )  
 ( F402-RR-401 ENGINE )  
 ( FAR FIELD NOISE )  
 ( OPERATION: )  
 ( IDLE )  
 ( 27% RPM )  
 ( FREE FLOW )  
 ( METEOROLOGY: )  
 ( TEMP = 15 C )  
 ( BAR PRESS = .760 M HG )  
 ( REL HUMID = 70 % )  
 ( IDENTIFICATION: )  
 ( OMEGA 1.4 )  
 ( TEST 75-002-006 )  
 ( RUN 01 )  
 ( 06 MAY 75 )  
 ( PAGE 21 )



( FIGURE: SOUND PRESSURE LEVEL (SPL)  
 ( EQUAL LEVEL CONTOURS (DB)  
 ( 10 500 HZ OCTAVE BAND  
 ( NOISE SOURCE/SUBJECT:  
 ( AV-8A AIRCRAFT  
 ( F402-RR-401 ENGINE  
 ( FAR FIELD NOISE  
 ( OPERATION:  
 ( IDLE  
 ( 27% RPM  
 ( FREE FLOW  
 ( METEOROLOGY:  
 ( TEMP = 15 C  
 ( BAR PRESS = .760 M HG  
 ( REL HUMID = 70 %  
 ( IDENTIFICATION:  
 ( OMEGA 1.4  
 ( TEST 75-002-006  
 ( RUN 01  
 ( 06 MAY 75  
 ( PAGE 22

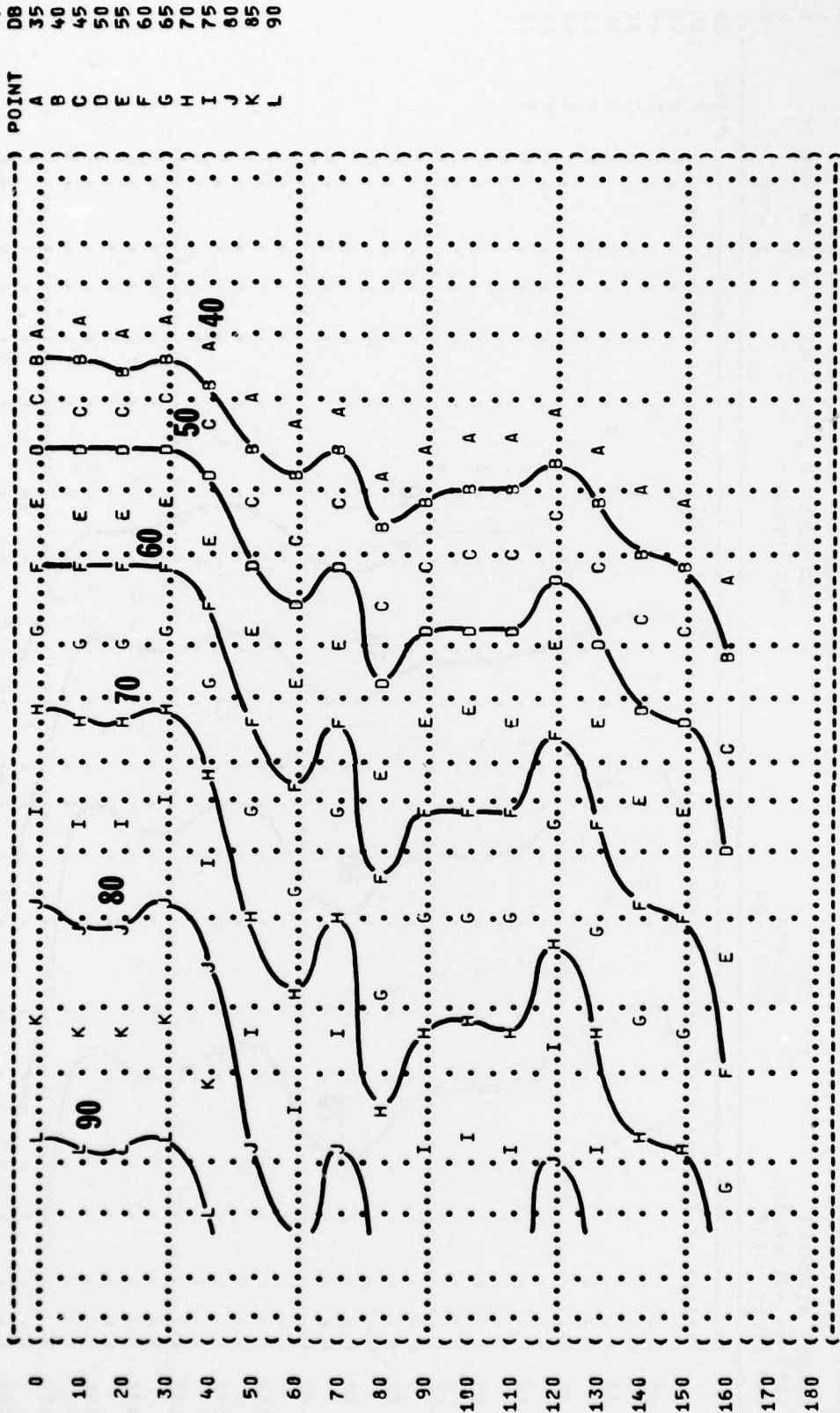


ISE SOURCE/SUBJECT: AV-8A AIRCRAFT  
F402-RR-401 ENGINE  
FAR FIELD NOISE

( ( OPERATION: ( ( IDLE  
( ( 27% RPM  
( ( FREE FLOW

( ( METEOROLOGY: ( ( TEMP = 15 C  
( ( BAR PRESS = .760 M HG  
( ( REL HUMID = 70 %

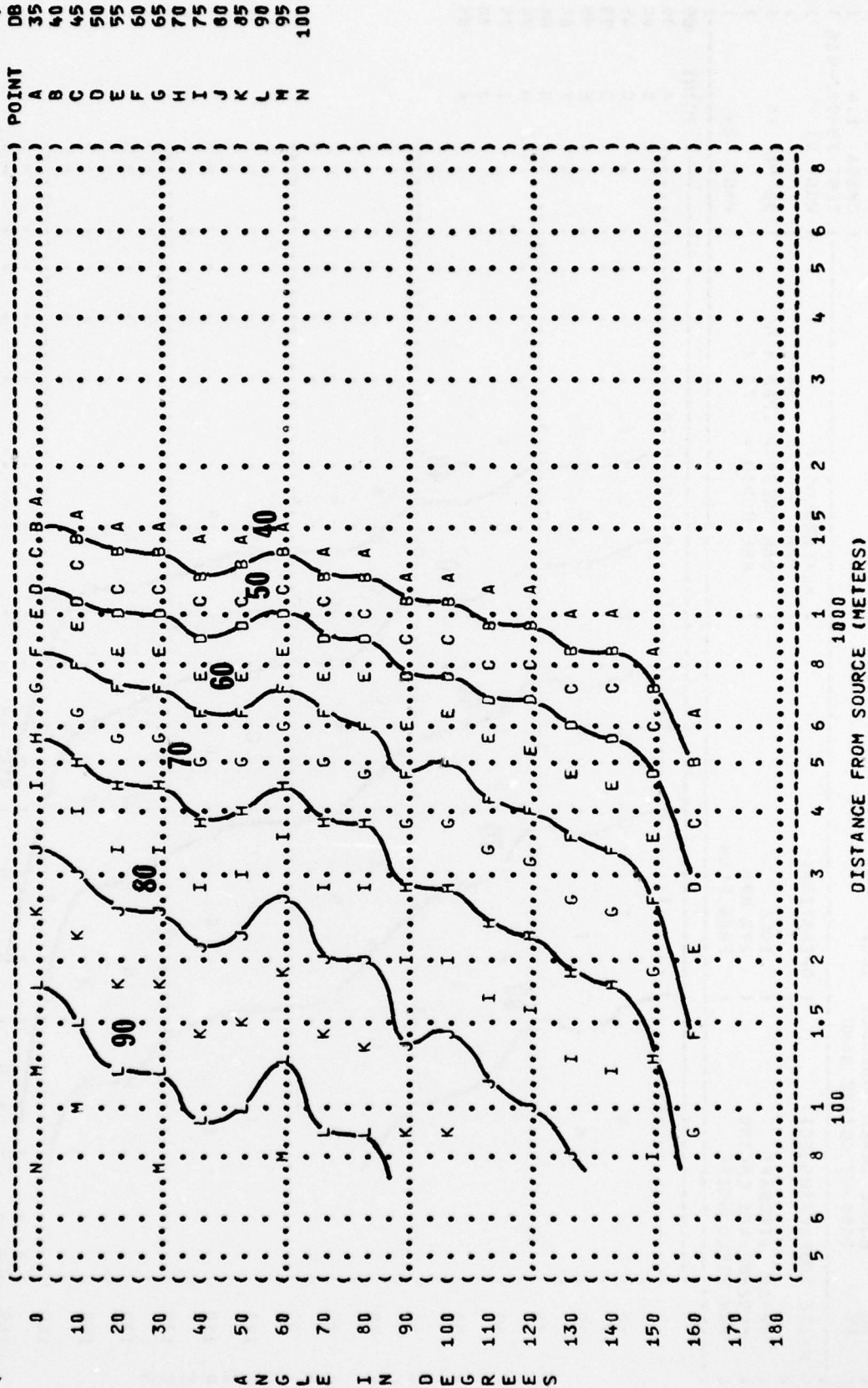
( ( ) RUN 01  
( ( ) 06 MAY 75  
( ( ) PAGE 23







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(-----)
( I FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( 10 EQUAL LEVEL CONTOURS (DB) ) )
( 4000 HZ OCTAVE BAND ) OMEGA 1.4 )
( ) TEST 75-002-006 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 01 )
( ) TEMP = 15 C ) )
( AV-8A AIRCRAFT ) BAR PRESS = .760 M HG ) 06 MAY 75 )
( F402-RR-401 ENGINE ) REL HUMID = 70 % ) )
( FAR FIELD NOISE ) FREE FLOW ) PAGE 25 )
(-----)
```



IDENTIFICATION:  
OMEGA 1.4

**OMEGA 1.4**

( OPERATION:  
(  
( IDLE  
( 27% RPM  
( FREE FLOW

METEOROLOGY:  
TEMP  
BAR PRESS  
REL HUMID

06 MAY 75  
PAGE 26

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ANGLE IN DEGREES

DISTANCE FROM SOURCE (METERS)



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(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( EQUAL LEVEL CONTOURS (DB) ) )
( 10 ) OMEGA 1.4 )
( 31.5 HZ OCTAVE BAND ) TEST 75-002-006 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 02 )
( ) TEMP = 15 C ) )
( AV-8A AIRCRAFT ) BAR PRESS = .760 M HG ) 06 MAY 75 )
( F402-RR-401 ENGINE ) FREE FLOW ) )
( FAR FIELD NOISE ) ) PAGE 18 )
(-----)
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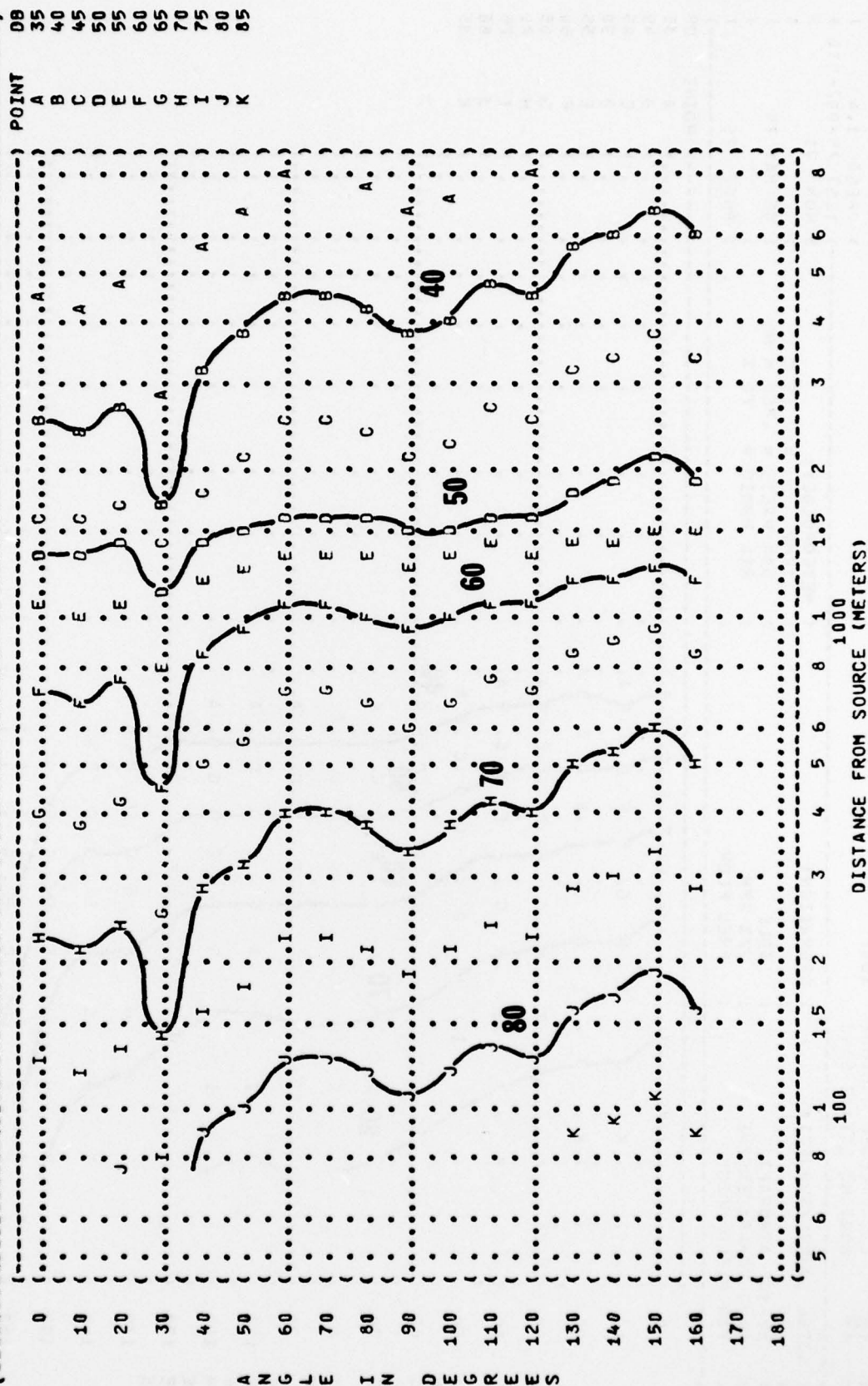


FIGURE 4 SOUND PRESSURE LEVEL {SPL}  
EQUAL LEVEL CONTOURS (DB)  
63 HZ OCTAVE BAND

10

NOISE SOURCE/SUBJECT: ( ) OPERATION: ( ) METEOROLOGY: ( )  
 ( ) AV-8A AIRCRAFT ( ) 55% RPM ( ) TEMP = 15 C  
 ( ) F402-RR-401 ENGINE ( ) FREE FLOW ( ) BAR PRESS = .760 M HG  
 ( ) FAR FIELD NOISE ( ) ( ) REL HUMID = 70 %

IDENTIFICATION: ( )  
 ( ) OMEGA 1.4  
 ( ) TEST 75-002-006  
 ( ) RUN 02  
 ( ) 06 MAY 75  
 ( ) PAGE 19

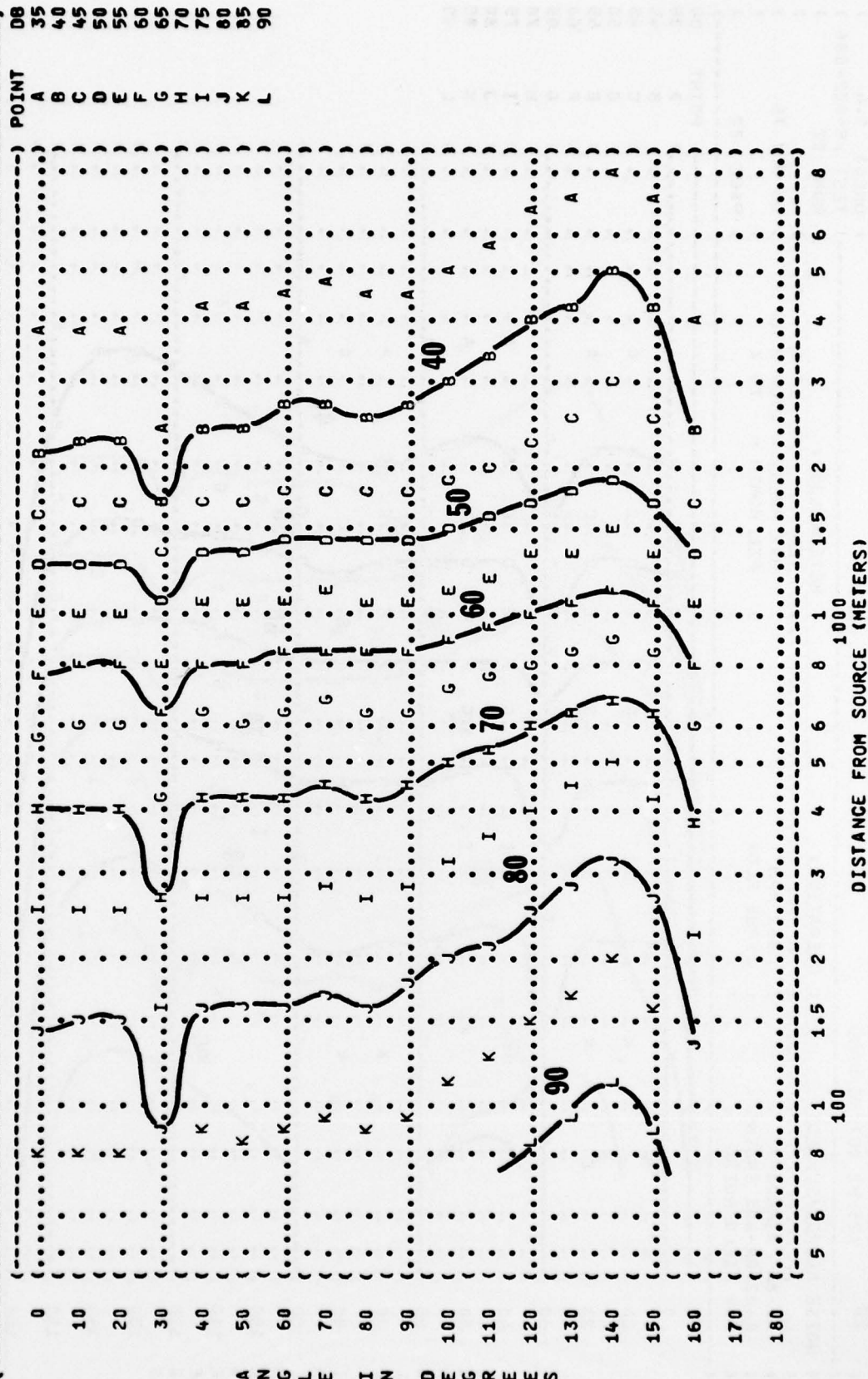


FIGURE: SOUND PRESSURE LEVEL (SPL)  
EQUIL LEVEL CONTOURS (DB)  
125 HZ OCTAVE BAND

10

IDENTIFICATION:

OMEGA 1.4

TEST 75-002-006

RUN 02

METEOROLOGY:

TEMP = 15 C

BAR PRESS = .760 M HG

REL HUMID = 70 %

OPERATION:

55% RPM

FREE FLOW

NOISE SOURCE/SUBJECT:

AV-8A AIRCRAFT

F402-RR-401 ENGINE

FAR FIELD NOISE

PAGE 20

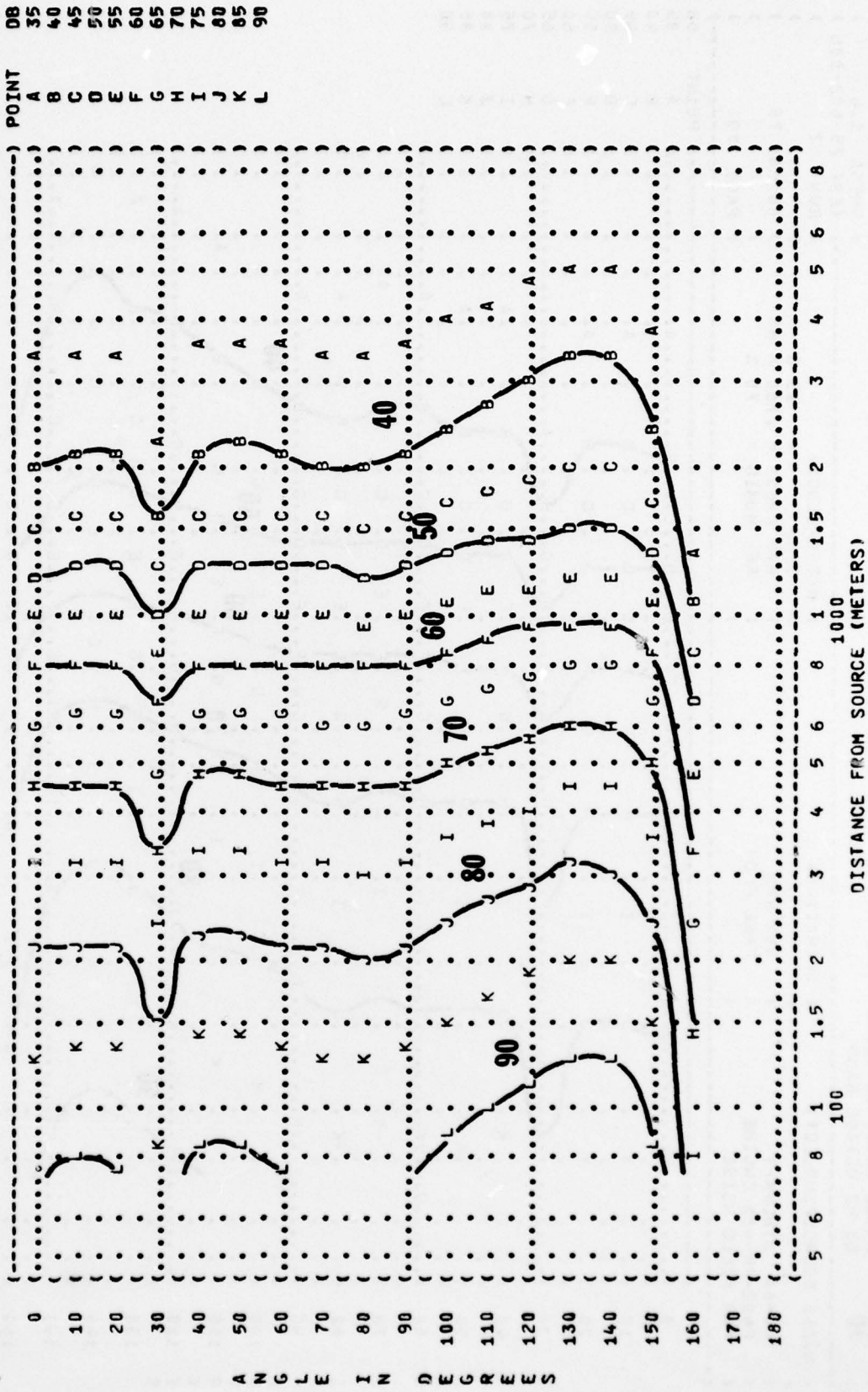
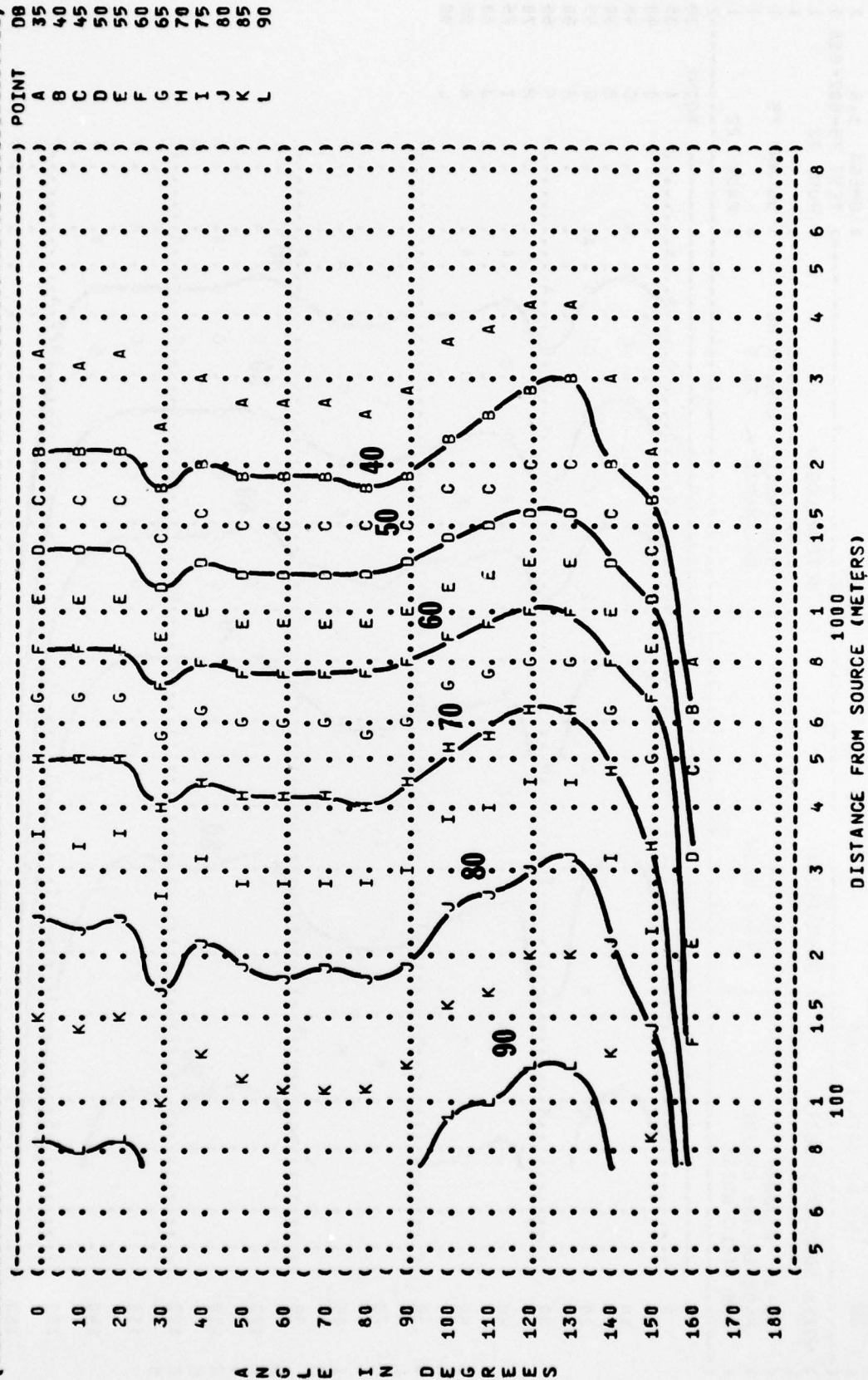
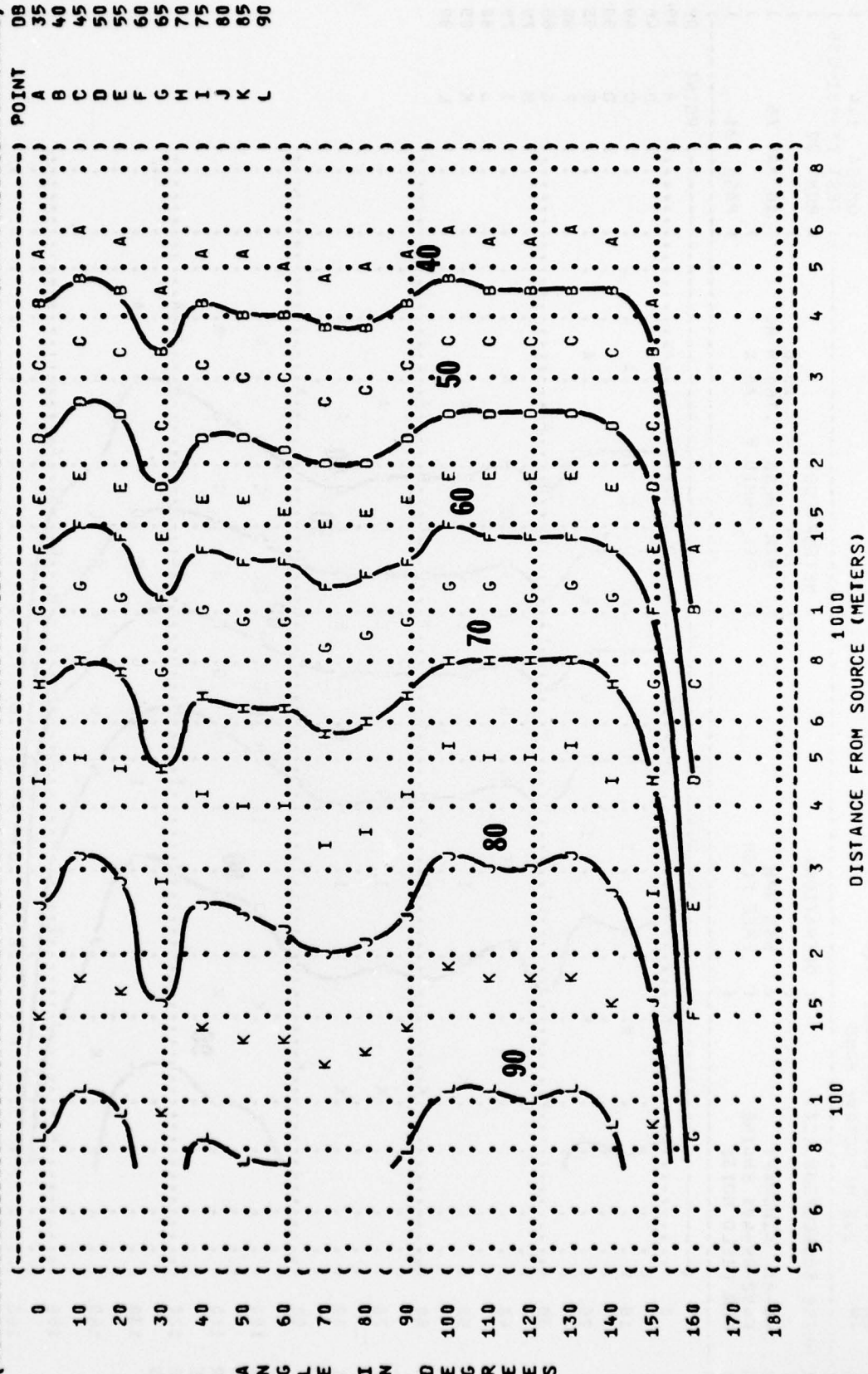




FIGURE:	SOUND PRESSURE LEVEL {SPL}	IDENTIFICATION:
10	EQUAL LEVEL CONTOURS (DB)	
	250 HZ OCTAVE BAND	OMEGA 1.4
NOISE SOURCE/SUBJECT:	OPERATION:	TEST 75-002-006
		RUN 02
		METEOROLOGY:
		TEMP = 15 C
AV-8A AIRCRAFT	55% RPM	BAR PRESS = .760 M HG
F402-RR-401 ENGINE	FREE FLOW	REL HUMID = 70 %
FAR FIELD NOISE		PAGE 21

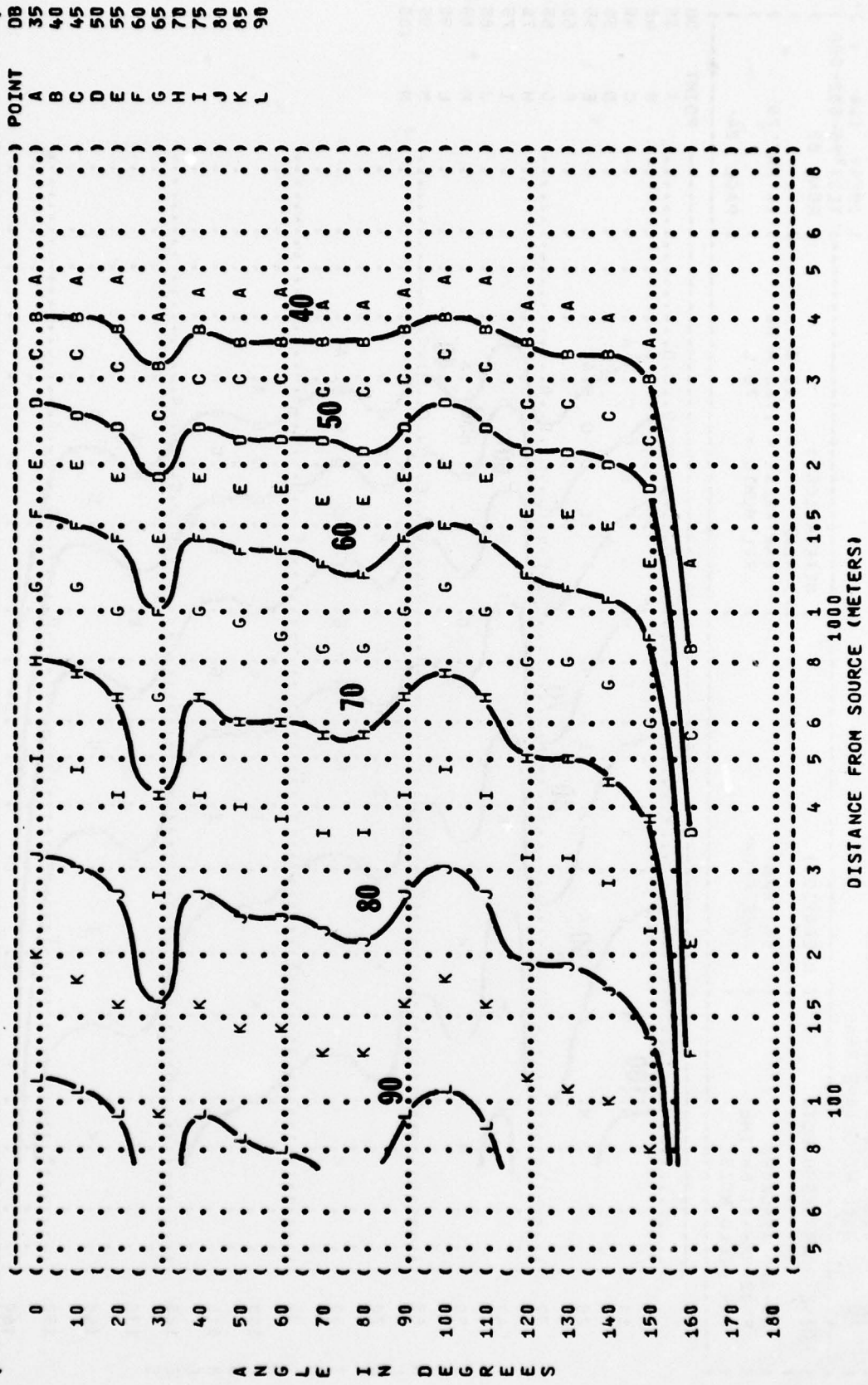


( FIGURE: SOUND PRESSURE LEVEL (SPL) )  
 ( 10 EQUAL LEVEL CONTOURS (DB) )  
 ( 500 HZ OCTAVE BAND )  
 ( NOISE SOURCE/SUBJECT: )  
 ( AV-8A AIRCRAFT )  
 ( F402-RR-401 ENGINE )  
 ( FAR FIELD NOISE )  
 ( OPERATION: )  
 ( 55% RPM )  
 ( FREE FLOW )  
 ( METEOROLOGY: )  
 ( TEMP = 15 C )  
 ( BAR PRESS = .760 M HG )  
 ( REL HUMID = 70 % )  
 ( IDENTIFICATION: )  
 ( OMEGA 1.4 )  
 ( TEST 75-002-006 )  
 ( RUN 02 )  
 ( 06 MAY 75 )  
 ( PAGE 22 )



A N G L E I N D E G R E E S

( FIGURE: SOUND PRESSURE LEVEL (SPL) )  
 ( 10 EQUAL LEVEL CONTOURS (DB) )  
 ( 1000 HZ OCTAVE BAND )  
 ( NOISE SOURCE/SUBJECT: )  
 ( AV-8A AIRCRAFT )  
 ( F402-RR-401 ENGINE )  
 ( FAR FIELD NOISE )  
 ( OPERATION: )  
 ( 55% RPM )  
 ( FREE FLOW )  
 ( METEOROLOGY: )  
 ( TEMP = 15 C )  
 ( BAR PRESS = .760 M HG )  
 ( REL HUMID = 70 % )  
 ( IDENTIFICATION: )  
 ( OMEGA 1.4 )  
 ( TEST 75-002-006 )  
 ( RUN 02 )  
 ( 06 MAY 75 )  
 ( PAGE 23 )





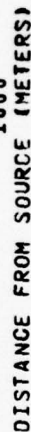
IDENTIFICATION: OMEGA 1.4

**OMEGA 1.4**

## 10 METEOROLOGY?

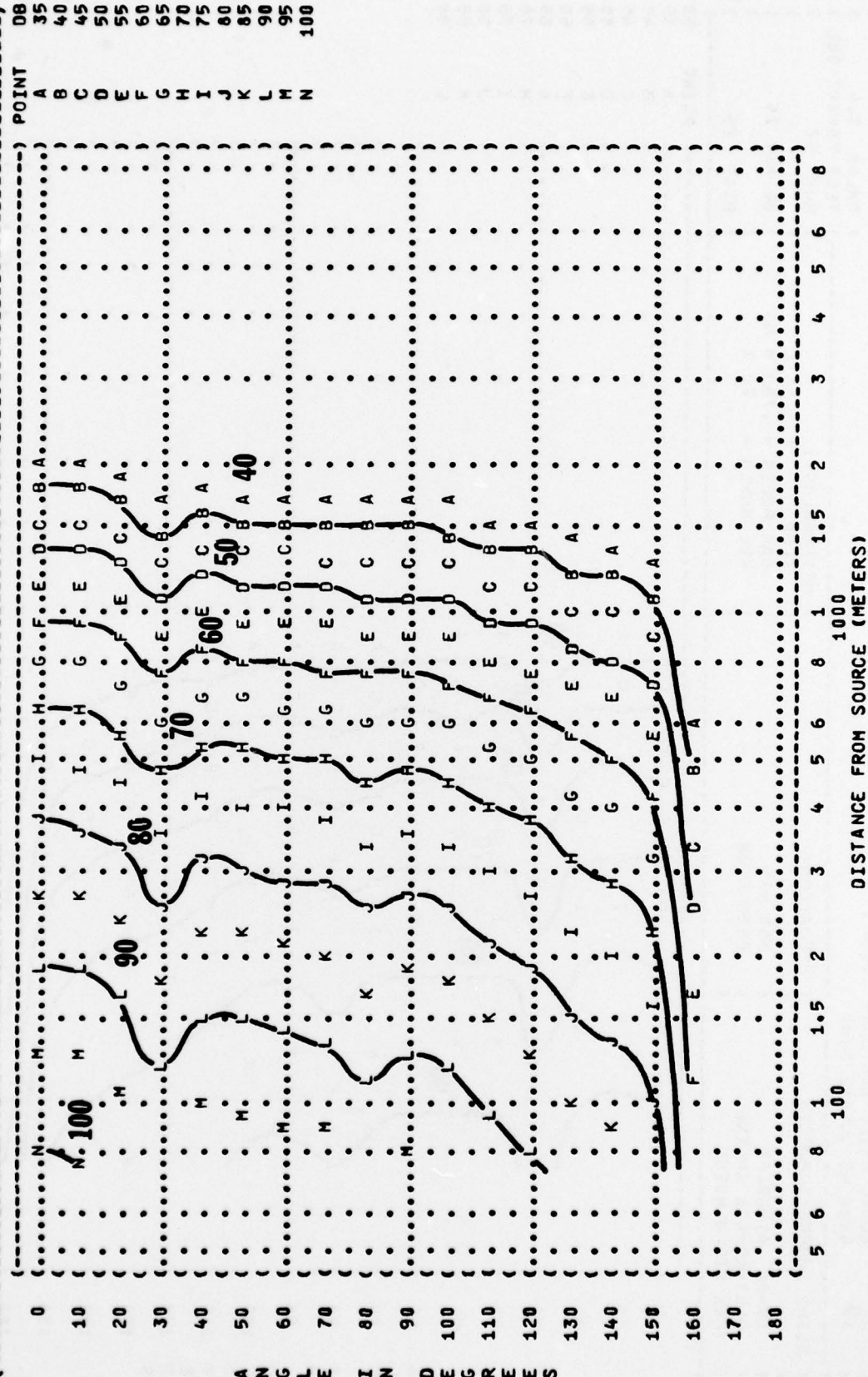
TEMP = 15 C  
BAR PRESS = .760 M HG  
REL HUMID = 70 %

**PAGE 24**



# ANGLE IN DEGREES

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(-----)
( FIGURE: SOUND PRESSURE LEVEL {SPL} ) IDENTIFICATION: )
( EQUAL LEVEL CONTOURS (DB) ) )
( 10 - 4000 HZ OCTAVE BAND ) OMEGA 1.4 )
( ) TEST 75-002-006 )
( NOISE SOURCE/SUBJECT: ) METEOROLOGY: ) RUN 02 )
( ) ) )
( AV-8A AIRCRAFT ) TEMP = 15 C )
( F402-RR-401 ENGINE ) BAR PRESS = .760 M HG )
( FAR FIELD NOISE ) REL HUMID = 70 % )
( ) ) PAGE 25 )
(-----)
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( ( FIGURE: SOUND PRESSURE LEVEL {SPL}
( ( EQUAL LEVEL CONTOURS (DB)
( ( 10
( ( 8000 HZ OCTAVE BAND
( (
( ( NOISE SOURCE/SUBJECT:
( (
( (
( ( AV-8A AIRCRAFT
( ( F402-RR-401 ENGINE
( ( FAR FIELD NOISE
( (
( ( OPERATION:
( (
( ( 55% RPM
( ( FREE FLOW
( (
( ( METEOROLOGY:
( (
( ( TEMP = 15 C
( ( BAR PRESS = .760 M HG
( ( REL HUMID = 70 %
( (
( ( IDENTIFICATION:
( (
( ( OMEGA 1.4
( ( TEST 75-002-006
( ( RUN 02
( (
( ( PAGE 26

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